MDP-A660K/K50
RMT-M36A

SERVICE MANUAL

US Model
Canadian Model
MDP-K50
E Model
Chinese Model
Hongkong Model
MDP-A660K

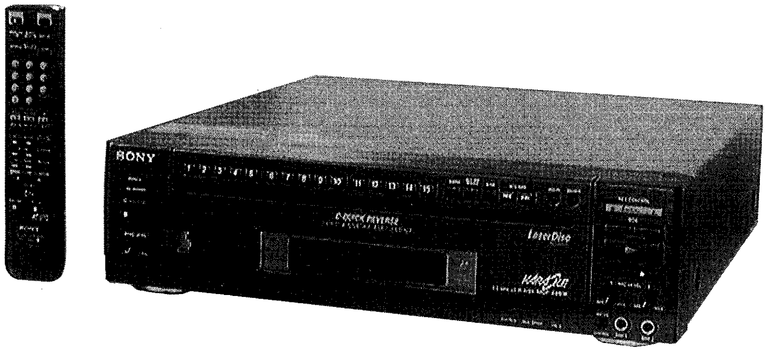


PHOTO : MDP-A660K

SPECIFICATIONS

System

Type
CD/CDV/LD player

Signal readout
Optical (Laser beam reflection)

Signal format system
EIA standard, NTSC color system

Playing time
See "Optical discs" on page 28.

Digital audio specifications

Signal-to-noise ratio
More than 115 dB (EIAJ)*

Dynamic range
More than 99 dB (EIAJ)

Wow and flutter
Below measurement limit (+0.001 % W.PEAK)(EIAJ)

Video specification

Horizontal video resolution
425 lines

Signal-to-noise ratio
More than 50 dB

* Measured according to EIAJ (Electric Industries Association of Japan) standards.

Input and Output

LINE OUT 1,2
VIDEO output, Phono jack (1)
Output signal: 1 Vp-p, 75 ohms, unbalanced
AUDIO output, Phono jacks (2)
Stereo L, R
Analog: 200 mVrms
(1 kHz, 40 % modulation)
Digital: 200 mVrms
(1 kHz, –20 dB)

LINE IN
VIDEO input, Phono jack (1)
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO input, Phono jacks (2)
Stereo L, R
Max. input level: 200 mVrms
(–20 dB)
Input impedance:
more than 47 kilohoms

MIC 1/2 jacks
Standard jacks
1 mV
(Impedance below 1 kilohm)

General

Power requirements
110–127/220–240 V AC, adjustble, 50/60 Hz (A660K)
120 V AC, 60Hz (K50)

Power consumption
45 W

Operating temperature
5°C to 35°C

Ambient humidity
5% to 90 %

Dimensions
Approx. 430 × 116 × 430 mm (w/h/d)
including projecting parts and controls

Mass
Approx. 7.5 kg

—Continued on next page—

使用時は添付資料も参照のこと
Refer to the additional documents.

CD/CDV/LD PLAYER

SONY®

Supplied accessories

Remote Commander RMT-M36A (1)
R6 (size AA) batteries (2)
Audio/Video Cable
(phono plug 3 ←→ phono plug 3) (1)
AC plug adaptor (supplied with models other than Hong Kong model) (1)

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replace-ment.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

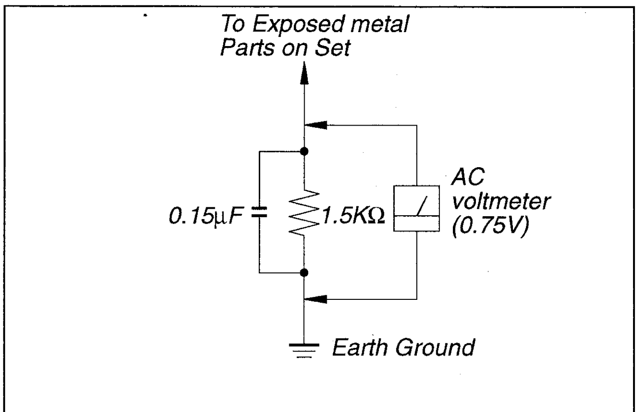


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage form any exposed metal parts to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as Simpson 229 or RCA WT-540A. Follow the manufactures’ instructions to use these instruments.
2. A battery operated AC milliammerter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75V, so analog meters must have an accurate lowvoltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

This CD CDV LD Player is classified as a CLASS 1 LASER product.

CAUTION

The use of optical instruments with this product will increase eye hazard.

As the laser beam used in this player is harmful to the eyes, do not attempt to disassemble the cabinet. Refer servicing to qualified personnel only.

Precautions

Safety

- If any liquid or solid object falls into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- The unit is not disconnected from the house current as long as it is connected to the AC outlet, even if the unit itself has been turned off.
- Unplug the unit from the wall outlet if you do not intend to use it for an extended period of time. To disconnect the cord, pull it out by the plug, never by the cord itself.

Installing

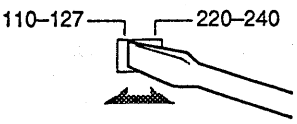
- Allow adequate air circulation to prevent internal heat buildup.
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the space under the unit.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not install the unit in an inclined position. It is designed to be operated in a horizontal position only.
- Do not place heavy objects on the unit.
- If the unit is brought directly from a cold to a warm location, moisture may condense inside the player. If this happens, playback may not start. When you first install the unit, or when you move it from a cold to a warm location, wait for about one hour before operating the unit.

Operating voltage

- Before operating the player, make sure that the operating voltage of your unit is identical with that of your local power supply. If necessary, reset the selector at the rear of the player to the voltage corresponding to your local power supply. The voltage selector of this unit is set to 220–240 V AC originally.

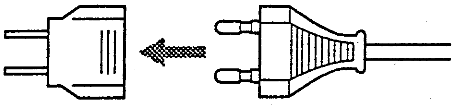
For	Set to
110–127 volts AC	110–127 V
200–240 volts AC	220–240 V

- To set the voltage selector, disconnect the AC power cord and set the selector to the appropriate position with a blade screwdriver.



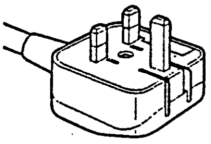
Using the AC power plug adaptor (for models other than Hong Kong model)

- If the AC plug on your unit does not fit into the wall outlet, attach the supplied AC plug adaptor.



AC plug of Hong Kong model

- The players for Hong Kong have an AC plug as shown below. The AC plug adaptor is not supplied with these units.



If you have any questions or problems concerning your unit, please contact your nearest Sony dealer.

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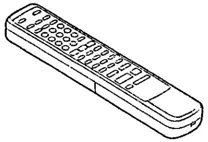
SECTION 1
GENERAL

This section is extracted from instruction manual (MDP-A660K).

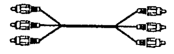
Step 1 Unpacking

Check that you have the following items:

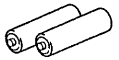
- **Remote commander RMT-M36A**



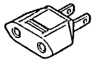
- **Audio/Video cable**



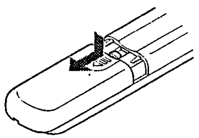
- **Two R6 (size AA) batteries**



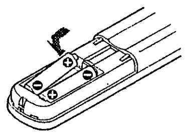
- **AC plug adaptor (supplied with models other than Hong Kong model)**



Step 2 Inserting batteries into the remote commander



1 Turn the commander over, and remove the cover.



2 Check the polarities and position two R6 (size AA) batteries correctly.

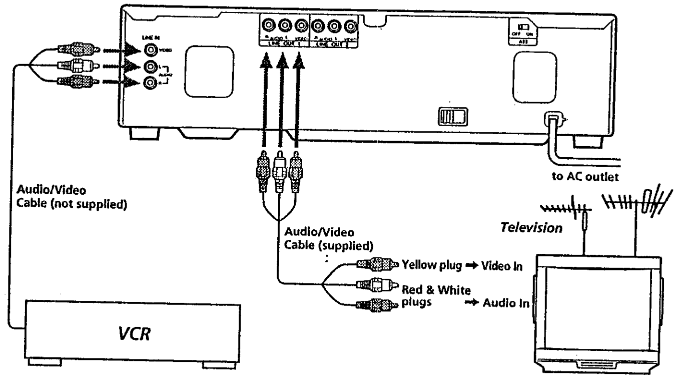
3 Close the cover.

Notes
- With normal use, the batteries should last for approximately six months.
- If you are not going to use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery together with an old one.
- Do not use different types of batteries together.

Step 3 Connecting the player

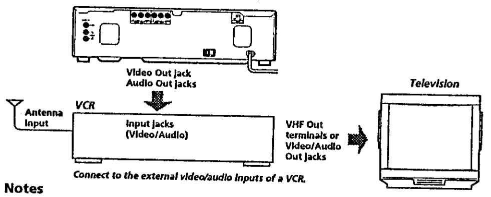
Television hook-up

To play LDs or CDVs, hook up a television to the LD Player. Take out the supplied audio/video connecting cable (yellow, red and white plugs). Use this to connect the player to the television. Once you have hooked-up the television, set the input selector on the TV to "Video." Before connecting or disconnecting any of the cables, turn off all equipment.


to AC outlet
Audio/Video
Cable (not supplied)
Television
Audio/Video
Cable (supplied)
Yellow plug → Video In
Red & White plugs → Audio In
VCR

Television/VCR hook-up

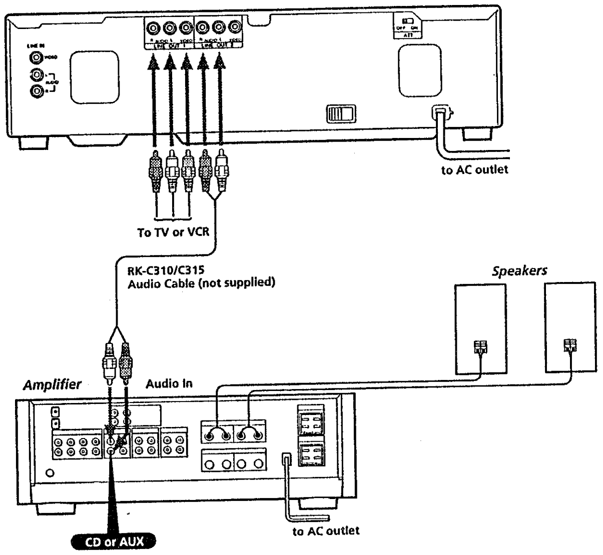
Connect the player to the VCR's inputs when:
– the video inputs of the TV are already used for the VCR or a similar machine.
– the TV has only an antenna input.
When you connect this player using the VCR's inputs, do not use the LINE IN jacks of the player to connect the VCR because doing so will cause interference with the sound or picture.


Video Out jack
Audio Out jacks
Television
Antenna Input
VCR
Input jacks (Video/Audio)
VHF Out terminals or Video/Audio Out jacks
Connect to the external video/audio inputs of a VCR.

Notes
- Make sure all equipment is turned off before connecting or disconnecting any cables.
- Connection methods may differ; when in doubt about a connection, consult the TV or VCR manufacturer's manual.
- If the sound or picture is disturbed by noise, try moving the equipment farther apart.
- Firmly insert plugs into the jacks. A loose connection may cause noise.
- To prevent interference with TV broadcast reception, turn off all equipment connected but not currently in use.
- If the TV only has a monaural phono jack for audio input, use a VMC-910/915 Connecting Cable (not supplied).

Audio equipment hook-up

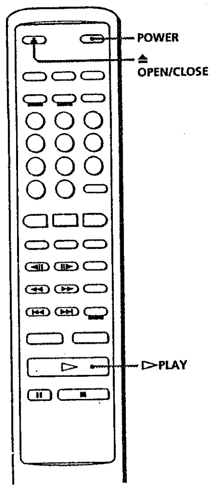
To achieve full stereo sound from your LD Player, hook up a stereo system following the diagram below. Use an RK-C310 (or RK-C315) audio connecting cable (not supplied) to connect the LD Player to your amplifier or receiver. Before connecting or disconnecting any cables, turn off all equipment.



Notes
- Make sure all equipment is turned off before making any of the above connections.
- Firmly insert plugs into the jacks. A loose connection may cause noise.
- When listening to a radio broadcast, turn off the LD Player to get better reception.

Basic Operations

Playing a disc



Tip
- You can also turn on the player by pressing ≜ OPEN/CLOSE on the player.

Notes
- If you place more than one disc on the tray, or if the disc is not seated properly, the disc may not start playing, and may cause damage the disc or player.
- Do not transport the player while playing a disc as doing so may damage your disc or player.
- Do not use a CD stabilizer when playing a CD as doing so may damage your disc or player.
- When you press ❚❚ PAUSE, the picture goes blank when playing a CLV LD or CDV, and the picture freezes when playing a CAV LD (see "Viewing frame-by-frame action" on page 24).

This section shows you how to play an LD, CD or CDV.

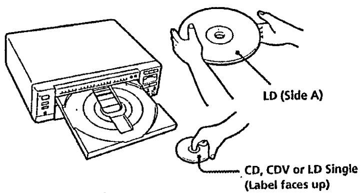
Before you start...
Connect the player to your TV and set the input selector on the TV to "Video" (see "Connecting the player" on page 6).

Loading and playing a disc

1 Press POWER to turn on the player.
You can also directly turn on the player by pressing ▷ PLAY on the player or remote commander.

2 Press ≜ OPEN/CLOSE to open the disc tray.
The front cover of the player automatically slides down and the disc tray comes out.

3 Place a disc on the disc tray.



Place only one disc on the tray, carefully fitting it in the circle on the tray.

4 Press ▷ PLAY.
The disc tray closes and the upper side of the disc starts playing. You can also start playing by pressing the disc tray to close it.
When playback of the upper side of an LD (side A) ends, the other side (side B) starts playing automatically.

To	Press
Stop play	■ STOP
Pause play	❚❚ PAUSE
Resume play after pause	❚❚ PAUSE or ▷ PLAY
Scan forward or backward	◀◀/▶▶ SCAN
Skip chapters or tracks	❙◀◀/▶▶❙ ACS/AMS
Go to a chapter/track	Number button
Remove the disc	≜ OPEN/CLOSE

Tips
- When playing a double-sided LD, the player determines that the upper side of the disc is side "A" and the other side is "B," regardless of the label "A" or "B" printed on the disc.
- When playing side A of an LD, CD or CDV, or when the player is stopped, the SIDE A button indicator on the player lights up. When playing side B of an LD, the SIDE B button indicator lights up.
- When playback of LD side B ends, the player stops.
- When playing a CD or CDV, the DISC SIDE B button does not function.

Note
- When you play a VCR, etc. using LINE IN, the current key level always appears on the front panel instead of a chapter/track number (see "Playing karaoke using auxiliary equipment" on page 18).

To start playing from the beginning of each LD side
Press DISC SIDE A to play the upper side of the LD from the beginning.
Press DISC SIDE B to play the other side of the LD from the beginning.

To pause playing just before starting
Press ❚❚ PAUSE instead of pressing ▷ PLAY after you place the disc on the tray.
The disc tray closes and the player waits at the start of the disc until you press ▷ PLAY or ❚❚ PAUSE. If you want to start from side B of an LD, press ❚❚ PAUSE, then DISC SIDE B.

To stop playing and turn off the player
Press POWER.
You can resume playback from the point you stopped at by simply pressing ▷ PLAY (see "Resuming LD playback" on page 19).

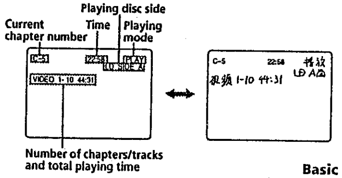
To stop playing and remove the disc
Press ≜ OPEN/CLOSE.
Remove the disc and press ≜ again to close the empty tray.

Chapter/Track number display on the front panel

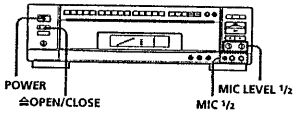
Indication	Current status of the player
12	Playing or pausing in chapter/track 12
12 (flashes)	Searching for chapter/track 12
- - (flashes)	Searching for the beginning of the disc
00	Playing chapter "0" of an LD
0	Stopped
-4	Modulated key level (appears briefly)
Not lit	No disc is loaded or playing an LD which has no chapters

Viewing the on-screen display

Press DISPLAY twice. The on-screen display appears (see "Understanding on-screen indications" on page 20). You can select the language of on-screen display, English or Chinese, by pressing the ■ STOP button on the player less than 10 seconds after you turn on the player. To return to the original display, press the ■ STOP button again less than 10 seconds after you first pressed it. Each time you press the ■ STOP button (within 10 seconds) the displys alternate.

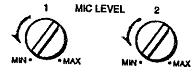


Playing Karaoke

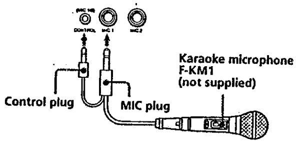


This section gives you short instructions for playing "karaoke" (singing along with a disc).

1 **Set the MIC LEVEL 1/2 controls on the player to MIN.**



2 **Plug a microphone into the MIC 1 or 2 jack on the player.**
When using the karaoke microphone F-KM1 (not supplied), plug the CONTROL plug into the CONTROL (MIC 1/2) jack.

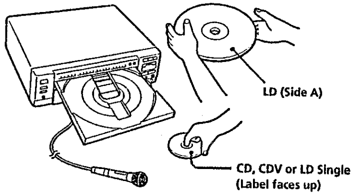


3 **Press POWER to turn on the player.**

4 **Turn on the TV and stereo system.**
TV:
Set to "Video."
Stereo system:
Turn on the amplifier or receiver and select CD or AUX for audio output.

5 **Press ≜ OPEN/CLOSE.**
The disc tray comes out.

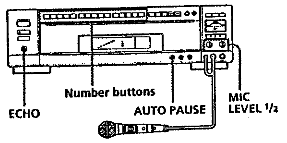
6 **Place a disc on the disc tray.**

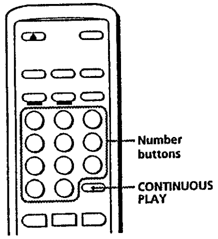


Place only one disc on the tray, carefully fitting it in the circle on the tray.

Tips
- You can plug in two microphones.
- To control the player from the microphone, plug the control plug into the CONTROL jack (see "Using the optional karaoke microphone" on page 18).
- You can enjoy karaoke using auxiliary equipment such as a VCR (see "Playing karaoke using auxiliary equipment" on page 18).

Notes
- If you insert more than one disc, or if the disc is not seated properly, the disc may not start playing, and may damage the disc or player.
- When playing a double-sided LD, the player determines that the upper side of the disc is side "A" and the other side is "B," regardless of the label "A" or "B" printed on the disc.





Tips

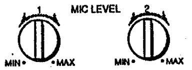
- If you press ■ STOP, ≜ OPEN/CLOSE or POWER while playing a song in karaoke mode (with microphones connected), the sound automatically fades out before playback stops (Auto Fade Out).
- If howling occurs
  - Move the microphone away from the speakers.
  - Lower the microphone volume or echo level.
  - Lower the volume.
- If the sound is distorted or the picture flickers when listening through your TV speakers, set the ATT switch at the rear of the player to ON to lower the output level.

Note

- If you reserve the next songs to be played (see "Specifying the next songs" on page 12), the player plays them continuously, then pauses.
- In non-karaoke mode (without microphones connected), the CONTINUOUS PLAY button on the remote commander does not function. To turn on/off the Auto Pause function in non-karaoke mode, use the AUTO PAUSE button on the player. Each time you press the AUTO PAUSE button, the Auto Pause function is turned on/off.

7 **Press one of the number buttons to enter the song you want to play.**
The disc tray automatically closes and the song starts playing. To choose a song on side B of the LD, press DISC SIDE B, then press the number button.

8 **Set the ON/OFF switch on the microphone to ON and turn the MIC LEVEL 1 or 2 control to adjust each microphone volume.**



9 **Turn the ECHO LEVEL control to adjust the strength of echo.**
The same echo level is applied to both MIC 1 and MIC 2.

ECHO LEVEL
MIN
MAX

Now you can enjoy playing karaoke. After the song is played, the player pauses and waits until you enter the number of the next song.

Pausing automatically in karaoke mode

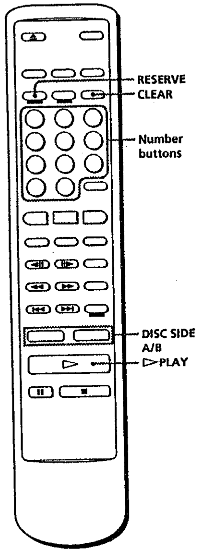
When you connect a microphone, the MDP-A660K automatically switches to karaoke mode. In karaoke mode, the player pauses every time a song is played (Auto Pause).

To play songs on the disc continuously in karaoke mode
Press CONTINUOUS PLAY on the remote commander or press AUTO PAUSE on the player.
"A. PAUSE OFF" appears on the screen briefly and the AUTO PAUSE button indicator on the player goes off.
Each time you press CONTINUOUS PLAY or AUTO PAUSE, the on-screen indication changes as follows and the AUTO PAUSE button indicator on the player turns off/on.

→ A. PAUSE OFF → A. PAUSE

AUTO PAUSE button indicator	Songs are played
On	Pausing at end of each song
Off	Continuously

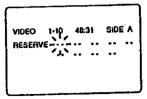
Specifying the next songs (Reserve)



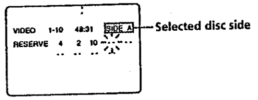
You can specify up to 9 songs to be played in any order you like, regardless of disc side, even while a song is being played. The songs are played continuously in the order you specify so that you can enjoy non-stop karaoke playing. The MDP-A660K also allows you to specify songs on another disc in advance (Next Disc Reserve).

Specifying songs on the current disc

1 **Press RESERVE.**
"RESERVE" appears.

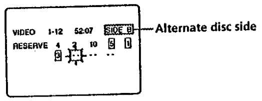


2 **Select the disc side by pressing DISC SIDE A (or B), then press the number buttons to specify songs in the order you want them to play.**

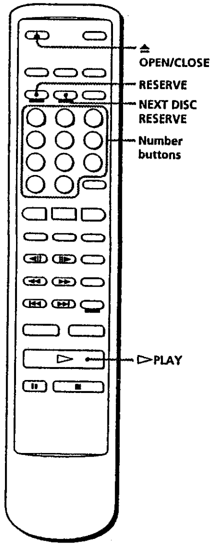


If you enter a wrong number, press CLEAR. With each press, the last song you have entered is deleted.

3 **To enter songs from the other disc side, press DISC SIDE B (or A), then press the number buttons to specify the songs in the order you want them to play.**



4 **Repeat steps 2 and 3 until you finish specifying songs.**


≜ OPEN/CLOSE
RESERVE
NEXT DISC RESERVE
Number buttons
▷PLAY

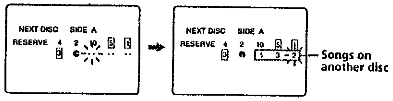
5 Press RESERVE.
On-screen indications disappear.

If you have reserved songs while playing a song, the songs start playing, without pausing after the current song.

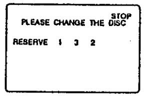
If you have specified songs while the player is stopped, press ▷ PLAY. The songs start playing.

Specifying songs on another disc (Next Disc Reserve)

1 Press NEXT DISC RESERVE after steps 1 to 4 above.
"◖" appears on the screen, rotating. Now you can specify songs on another disc. Follow steps 2 (and 3) above to specify the songs.


NEXT DISC SIDE A
RESERVE 4 2 10 5 1
3
NEXT DISC SIDE A
RESERVE 4 2 10 5 1
3 1 3 2
Songs on another disc

2 Press RESERVE (then ▷ PLAY).
The songs on the current disc are played, then the player stops automatically, and prompts you to change the disc.


PLEASE CHANGE THE DISC
STOP
RESERVE 1 3 2

3 Press ≜ OPEN/CLOSE to open the disc tray, then change the disc.

4 Press ▷ PLAY or push in the disc tray.
The specified songs on the new disc start playing automatically.

Tip
- You can also use Reserve (and Next Disc Reserve) in non-karaoke mode (without microphone connected).

Notes
- When you play songs using Reserve (and Next Disc Reserve), the songs are played continuously, and you cannot use Auto Pause. In karaoke mode (with microphones connected), the player enters pause mode after playing all the reserved songs.
- You cannot use Reserve and Repeat at the same time.
- You cannot specify tracks over 80 on a CD using Next Disc Reserve.

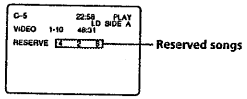
Specifying the next songs
(continued)

Tip
- You can enter numbers up to 15 using the number buttons on the player.

To enter a number greater than 10
Press (+10) on the remote commander, then one of the number buttons.
If you press (+10) by mistake, press (+10) repeatedly until "– –" flashes, then enter the correct number.

To	Press
Enter 14	(+10), then ④.
Enter 25	(+10), (+10), then ⑤
Enter 30	(+10), (+10), (+10), then ⓪

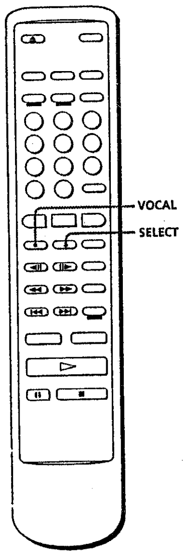
To check the songs to be played
Press DISPLAY twice.
The song numbers to be played appear. When a song has been played, its number disappears.


C-5
22:58
PLAY
LD SIDE A
VIDEO 1-10 48:31
RESERVE 4 2 5
Reserved songs

To skip the current song
Press ▶▶I.
The next reserved song starts playing.

Canceling Reserve
Press CLEAR.
"CLEAR" appears briefly and the player exits Reserve mode. All the reserved songs are cleared.

Using karaoke functions



Tip
- When you connect your VCR to the LINE IN input on the player and set the player to line in mode (see "Playing karaoke using auxiliary equipment" on page 18), you can also use Vocal Select for karaoke video tapes.

Note
- When playing multiplex CDVs or non-multi audio (analog or digital) LDs, you can only use VOCAL 1.

You can enjoy karaoke using various functions.

Singing along with the original vocals (Vocal Select)

You can listen to words or melody you forget by listening to the original vocals. This is available in karaoke mode for karaoke discs or tapes.

To listen to the original vocals on MULTI AUDIO LDs
On MULTI AUDIO karaoke LDs, vocals are recorded on an analog track. When playing MULTI AUDIO karaoke LDs, the player automatically outputs the backup sound recorded on digital tracks in stereo. To listen to the vocals, use Vocal Select. You can easily select the analog track on which the vocals are recorded.

1 Press VOCAL to turn on the SELECT button indicator.
2 Press SELECT repeatedly until the vocals are heard.
With each press, the on-screen indication changes as follows:

→ VOCAL 1 → VOCAL 2 → VOCAL 3 ┐

Indication	Output sound recorded on
VOCAL 1	Right analog track
VOCAL 2	Left analog track
VOCAL 3	Right analog track (with stereo sound on digital tracks)

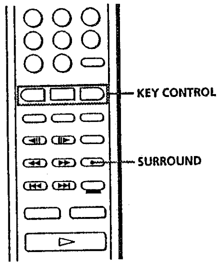
To listen to the original vocals on karaoke CDs, CDVs, or tapes
When playing karaoke CDs (or CDVs) or karaoke tapes in karaoke mode (with microphones connected), the player automatically outputs backup sound recorded on the left channel. To listen to the vocals, use Vocal Select to also output the original vocals recorded on another track.

1 Press VOCAL to turn on the SELECT button indicator.
2 Press SELECT repeatedly to select the sound.
With each press, the on-screen indication changes as follows:

→ VOCAL 1 → VOCAL 2 ┐

Indication	Output
VOCAL 1	Vocals with backup sound from both speakers
VOCAL 2	Stereo (Backup sound from left speaker and vocals from right speaker)

To cancel Vocal Select
Press VOCAL to turn off the SELECT button indicator.
"VOCALSEL OFF" appears on the screen briefly.



Tips
- There are seven KEY CONTROL indicators on the front panel of the player, which approximately display backup key adjustment level (17 steps available). There are three for ♯ UP adjustment, three for ♭ down adjustment, and one for ♮ NATURAL only (7 indicators for 17 steps). When a higher or lower key is selected, the ♯ UP or ♭ DOWN button on the player lights up umber.
- In karaoke mode, the key returns to the original key when playback pauses automatically at the end of a song. If Auto Pause is canceled, the key does not change at the end of a song. However, when playing in single repeat mode, the key returns to the original key at the end of the song even if Auto Pause is canceled.
- You can also adjust the key from the karaoke microphone (see "Using the optional karaoke microphone" on page 18).
- You can also use Key Control and Surround in non-karaoke mode (without microphones connected).

Note
- You cannot use Surround with any of the following functions:
  - Vocal Select ,
  - Vocal Support
  - Karaoke Pon

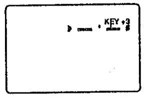
Changing the backup key (Key Control)

You can adjust the backup key to your voice.

Press ♯ UP or ♭ DOWN repeatedly to find the backup key that suits your voice.

To	Press
Raise the key	♯ UP
Lower the key	♭ DOWN
Return to the original key	♮ NATURAL

The key is adjustable to one of 17 steps (8 steps higher, 8 steps lower than the original key, and the original key). Your setting appears on the screen briefly.



Playing a disc with sound effect (Surround Sound)

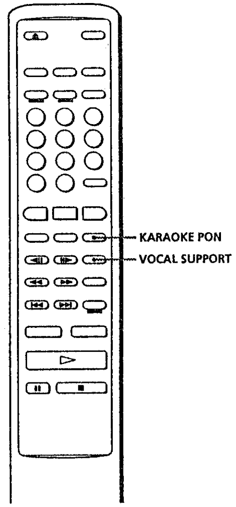
You can play a disc in one of three acoustic atmospheres: SIMULATED, KARAOKE BAR or MOVIE.
Press SURROUND repeatedly to select the effect.
With each press, the on-screen indication changes as follows:

→ SIMULATED → KARAOKE BAR → MOVIE → SURROUND OFF ┐

The SURROUND MODE indicator on the player lights up.

Indication	Atmosphere
SIMULATED	Good for playing software recorded in monaural. Enhances the dynamic range for monaural programmes like old movies and news programmes.
KARAOKE BAR	Creates the effect of singing in a bar. Gives your song a rich carrying tone.
MOVIE	Suitable for movie software. Emphasizes the bass and extends the dynamic mid range.

To cancel the surround effect
Press SURROUND repeatedly until "SURROUND OFF" appears.
The SURROUND MODE indicator goes off.



Tips
- Using the Vocal Support function, you can sing a duet by yourself. You can sing the male part (or female part) and the other part comes in when you stop singing.
- You can also use Karaoke Pon in non-karaoke mode (without microphones connected).

Notes
- You cannot use Vocal Support in non-karaoke mode (without microphones connected).
- Karaoke Pon is only available for discs recorded in stereo. With monaural discs, the backup level is also lowered.
- You cannot completely shut off the vocals by using Karaoke Pon. Even with stereo discs, if the voice deviates from the center, its level may not be lowered well.
- When using Karaoke Pon, stereo effect is reduced.

Letting the vocals help you (Vocal Support)

You can let the original vocals come in when you forget the words or melody. This is available for MULTI AUDIO discs, or multiplex discs or tapes.

Press VOCAL SUPPORT to turn on the VOCAL SUPPORT button indicator on the player.
"SUPPORT" appears on the screen briefly.
While you are singing into the microphone, the player outputs the backup sound, but when you are not, it also outputs the singer's voice to help you.

To turn off Vocal Support
Press VOCAL SUPPORT again to turn off the VOCAL SUPPORT button indicator on the player.
"SUPPORT OFF" appears on the screen briefly.

Enjoying karaoke with non-karaoke discs (Karaoke Pon)

With a disc recorded in stereo, you can enjoy karaoke even if it is a non-karaoke disc.

Press KARAOKE PON to turn on the KARAOKE PON indicator on the player.
"KARAOKE PON" appears on the screen.
The volume of the singer's voice is lowered.

To turn off Karaoke Pon
Press KARAOKE PON again to turn off the KARAOKE PON indicator on the player.
"K. PON OFF" appears on the screen briefly.

Using karaoke functions
(continued)

Tip
- When using two microphones, Repeat Singing and Key Control are only operable on the microphone connected to the CONTROL (MIC 1/2) jack.

Note
- When you play a VCR etc. using LINE IN:
  - Always turn on the LD player.
  - Stop playing the disc by pressing ■ STOP. When playing a disc, you cannot use LINE IN.

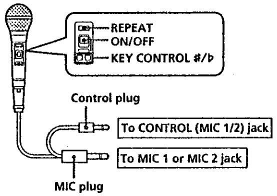
Tip
- When you use LINE IN, Vocal Select operates as it would do for CDs (VOCAL 1 and VOCAL 2).

Using the optional karaoke microphone

You can control the player from the karaoke microphone (F-KM1, not supplied) by connecting the control plug to the CONTROL jack on the player.

To sing Repeatedly
You can go back to any point of a song using the REPEAT button on the microphone. Hold down REPEAT and release it at the desired point. Playback continues again from the point at which the button is released.

To use Key Control
You can change the backup key by pressing KEY CONTROL ♯/♭ on the microphone. This is the same operation as KEY CONTROL on the player or remote commander (see "Changing the backup key" on page 16).

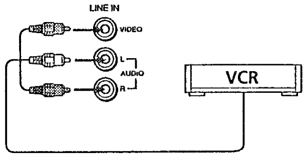


Playing karaoke using auxiliary equipment

You can also enjoy karaoke by connecting auxiliary equipment such as a VCR to the LINE IN AUDIO/VIDEO inputs on the player. The karaoke functions (Vocal Select, Key Control, Surround Effect, Vocal Support and Karaoke Pon) are available as they would be for discs.

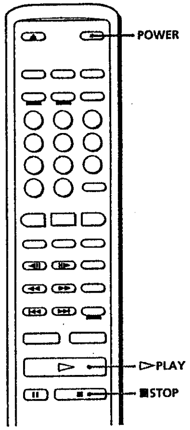
1 Connect the VCR to the LINE IN AUDIO/VIDEO inputs on the rear.
2 Press LINE IN on the player.
The LINE IN button indicator on the player lights up.

If a disc is being played, press ■ STOP to stop playing it.
Now you can enjoy playing karaoke with your video tape.
To return to playing a disc, press ▷ PLAY.



VMC-810 audio/video cable (not supplied)

Resuming LD playback (Auto Resume)



Tips

- Each time you stop playing, the point at which you stopped is stored.
- The point at which you stopped playing is cleared when:
  - you completely open the disc tray, press DISC SIDE A/B or I◀◀/▶▶I ACS/AMS.
  - you do a Chapter Search.
  - you unplug the player.

  If you press ≜ OPEN/CLOSE to close the disc tray when it is open halfway, the point at which you stopped is retained.

Notes

- The point at which you stopped is not stored if you stop playback during a Chapter Search.
- If you press ▷ PLAY when the power is off, the player turns on automatically. If a disc is loaded, playback resumes where you last stopped.
- If you connect a microphone (switching the player to karaoke mode), Auto Resume is canceled. Although Auto Resume is not canceled if you set the player to LINE IN, it is canceled if you connect a microphone.

This function operates automatically only for LDs. Once you stop playing an LD by pressing ■ STOP or POWER, the player stores the point you stopped at so that you can continue viewing from the same point.

1 **Press ■ STOP (or POWER) to stop playback.**
The AUTO RESUME indicator on the player lights up and the point you stopped at is stored (if you press POWER, the indicator lights up briefly, then goes off with the power).

2 **Press ▷ PLAY.**
The player searches for the scene at which you stopped playing, then playback starts.

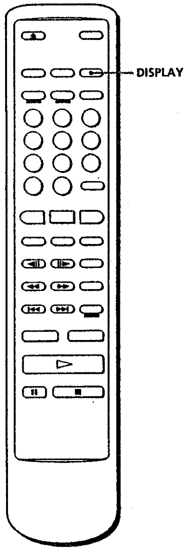
To pause playing just before starting

If the player is turned on, press II PAUSE instead of ▷ PLAY.
If the player is turned off, press POWER or ▷ PLAY to turn on the player, then press II PAUSE.

To view from the beginning of the LD

Press DISC SIDE A to start playing from the beginning of side A.
Press DISC SIDE B to start playing from the beginning of side B.
The point at which you stopped is cleared.

Understanding on-screen indications



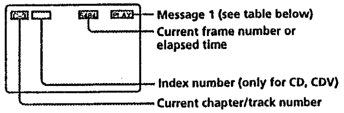
Notes

- When playing an LD which does not contain TOC data, total playing time of the disc does not appear.
- When playing an LD which does not contain chapters, the chapter number does not appear.
- When playing a CLV LD which does not contain time data to the second, a two-digit number such as "22:", meaning 22 minutes, appears.
- Messages concerning sound control functions such as "1/L, 2/R" or "♪ DIGITAL, ♪ ANALOG" appear only briefly when you press the AUDIO MONITOR or ANALOG/⊡ button.

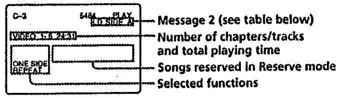
You can view the operating status of the player or disc information on the TV screen.

Displaying on-screen indications

Press DISPLAY.
The operating status of the player is displayed on the screen.


C-3
5484
PLAY
Message 1 (see table below)
Current frame number or elapsed time
Index number (only for CD, CDV)
Current chapter/track number

Press DISPLAY again.
Operating status and disc information are displayed on the screen.


C-3
5484
PLAY
LD SIDE A
VIDEO 1: 6 24:31
ONE SIDE REPEAT
Message 2 (see table below)
Number of chapters/tracks and total playing time
Songs reserved in Reserve mode
Selected functions

Press DISPLAY once again to turn off the indications.

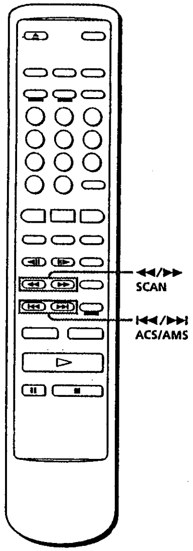
Message 1

Display	Current status of the player
OPEN	Disc tray open
CLOSE	Disc tray closed
PLAY	Playing a disc
STOP	Operation stopped
PAUSE	Operation momentarily stopped
◀◀/▶▶	Speed scanning
SEARCH	Searching

Message 2

Display	Currently playing
LD SIDE A	Side A of LD
LD SIDE B	Side B of LD
CD	CD
CDV	CDV
1/L	First soundtrack/left channel
2/R	Second soundtrack/right channel
♪ DIGITAL	Digital sound
♪ ANALOG	Analog sound

Searching for a particular point on the disc



Note
- When scanning a CLV LD or CDV, frames are skipped.
- A certain amount of visual noise and instability is inevitable when scanning an LD.

Tips
- ACS/AMS is the abbreviation for Automatic Chapter Sensor/Automatic Music Sensor.
- In addition to normal play mode, you can do Speed Scan and Skip Search while in Freeze Frame (CAV LD), Repeat or Pause mode. After the scan or search, playback continues in the same mode.

You can locate a particular point on a disc by scanning scenes or skipping chapters/tracks.

Scanning a disc quickly (Speed Scan)

Hold down ◀◀/▶▶ SCAN while playing the disc.

To	Hold down
Scan forward	▶▶ SCAN
Scan backward	◀◀ SCAN

To resume normal playback, release ◀◀/▶▶ SCAN.

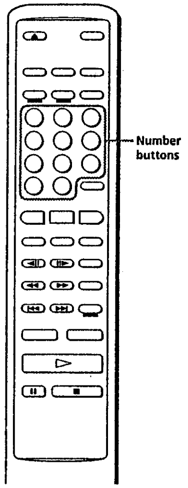
Skipping chapters or tracks (Skip Search)

Press or hold down I◀◀/▶▶I ACS/AMS.

To go to the beginning of	Press
Next chapter/track	▶▶I ACS/AMS once
Current chapter/track	I◀◀ ACS/AMS once
Previous chapter/track	I◀◀ ACS/AMS twice before the picture or sound resumes

Hold down ▶▶I or I◀◀ to skip chapters/tracks continuously.

Specifying a chapter or track directly (Chapter/Track Search)



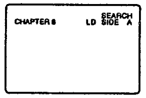
Tips
- In addition to normal play mode, you can do Chapter/Track Search while in Freeze Frame (CAV LD), Repeat or Pause mode. When the specified chapter or track is located after the search, playback continues in the same mode.
- When you do Chapter/Track search while a song is automatically paused in karaoke mode, the selected chapter or track starts playing immediately, without entering pause mode.

Note
- Chapter Search does not function properly if the LD does not contain chapter numbers, or if the chapter number entered does not exist.

LDs are divided into sections called "chapters." CDs and CDVs are divided into sections called "tracks." Simply enter the desired chapter/track number to go to a chapter or track and start playing it immediately.

Locating a particular chapter/track

Press one of the number buttons to enter the chapter/track number.

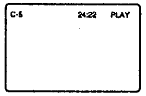


To play a chapter on the opposite side of the LD, press DISC SIDE B (or A), then enter the chapter number.

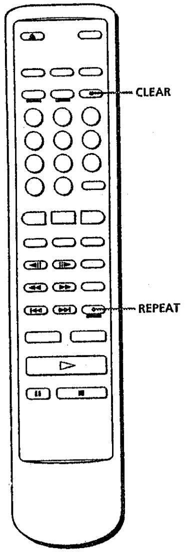
To enter a number greater than 10
Press ⑩ , then one of the ⓪ – ⑨ buttons. If you press ⑩ by mistake, press CLEAR, then enter the correct number.

To	Press
Enter 14	⑩ , then ④
Enter 25	⑩ , ⑩ , then ⑤
Enter 30	⑩ , ⑩ , ⑩ , then ⓪

To check the current chapter/track number
Press DISPLAY to display the chapter track number.
The number appears in the upper left-hand corner of the screen. If the LD does not contain chapter numbers, no number is displayed.



Playing a section repeatedly (Repeat Play)



Repeat play allows you to play the disc over and over. You can replay both sides, a single side or one chapter of an LD; and a whole disc or a single track on a CD.

Repeating chapters/tracks

Press REPEAT.
When playing an LD, the on-screen indication changes as follows each time you press REPEAT:

→ REPEAT → SINGLE REPEAT → ONE SIDE REPEAT → Repeat off (indication disappears)

When playing a CD or CDV, the on-screen indication changes as follows each time you press REPEAT:

→ REPEAT → SINGLE REPEAT → Repeat off (indication disappears)

Indication	Repeated chapters/tracks
REPEAT (All Disc Repeat) :	All chapters on both sides of the LD All tracks on the CD/CDV
SINGLE REPEAT	Current chapter/track
ONE SIDE REPEAT (LD only)	All chapters on the current side of the LD

To view the replaying status on the screen
Press DISPLAY twice.

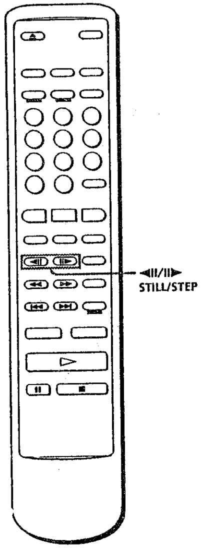
Canceling Repeat Play

Press CLEAR.

Tip
- When you play an LD in All Disc Repeat mode, the player plays through both sides of the LD repeatedly.

Note
- You cannot use Repeat and Reserve at the same time.

Viewing frame-by-frame action



You can use this function only for CAV LDs. During any scene, you can freeze play into a still picture, and then advance or reverse the action frame-by-frame.

Freezing the action (Freeze Frame)

Press **II** PAUSE or one of the ◄II/II► STILL/STEP buttons while playing a CAV LD.
The sound mutes and the picture freezes.

To resume normal playback
Press ▷ PLAY.

Playing frame-by-frame (Step Play)

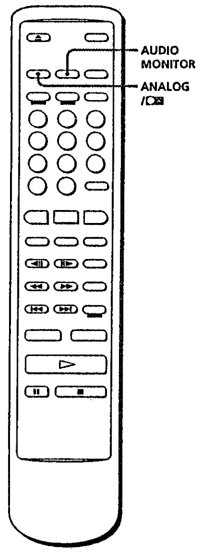
1 **Press one of the ◄II/II► STILL/STEP buttons while playing a CAV LD.**
The sound mutes and the picture freezes.

2 **Press ◄II or II► repeatedly to advance or reverse the action frame-by-frame.**
Hold down ◄II or II► to view continuous frame-by-frame action.

To resume normal playback
Press ▷ PLAY.

Tip
- When you play a CLV LD, Freeze Frame and Step Play are not available. When you press **II** PAUSE, the screen goes blank. If you press ◄II /II► STILL/STEP, "CLV SIDE A" appears briefly.

Using the sound control functions



Note
- The output level may differ between digital and analog sound.

Playing a stereo disc or Second Audio Program (SAP) disc

When playing SAP discs such as bilingual discs, you can alternate the sound output using AUDIO MONITOR.

To alternate the sound output
Press AUDIO MONITOR while playing the disc.
Each time you press AUDIO MONITOR, the on-screen indication changes as follows:

→ 1/L → 2/R → 1/L 2/R ┐

Indication	From stereo disc	From SAP disc
1/L	Left channel	Sound track 1 (Left channel)
2/R	Right channel	Sound track 2 (Right channel)
1/L 2/R	Stereo (Both channels)	Sound track 1 (Left channel) Sound track 2 (Right channel)

When you select 1/L (or 2/R), the sound of the left (or right) channel is output from both speakers.

Listening to analog sound on an LD

If your LD contains digital soundtracks, the player automatically outputs digital sound. To listen to sound recorded on analog soundtracks, use ANALOG/CX.

Press ANALOG/CX while playing the disc.
"♪ ANALOG" appears briefly on the screen and the analog sound is output.

To return to digital sound
Press ANALOG/CX repeatedly until "♪ DIGITAL" appears on the screen.

Playing discs with a CX (CX) logo

LDs bearing the CX logo are recorded with the CX noise reduction system, which gives lower noise level and higher dynamic range on analog sound. The player detects most CX discs and activates the CX noise reduction system automatically when outputting analog sound. If your CX LD does not contain a code to activate the CX noise reduction system, you can activate the CX noise reduction system manually while playing only analog sound.

To activate the CX noise reduction system manually
Press ANALOG/CX repeatedly until "CX ON" appears. The CX noise reduction system is activated.

Additional Information

Troubleshooting

	Symptom	Remedy
Power	No Power	• Connect the AC power cord securely.
Karaoke	No sound from microphone	• Switch the microphone on. • Turn up the MIC LEVEL 1 or 2 control on the player.
	Distorted sound	• Set the ATT switch at the rear of the player to ON.
	Howling occurs	• Move the microphone away from the speakers. • Lower the volume. • Lower the microphone volume or echo level.
Playback	Playback does not start	• Insert the disc correctly. When playing a CD, CDV or LD single, place it with the label facing up. • Select the disc side on which signals are recorded. • If there may be moisture condensation within the player, wait for about one hour before operating the player. • Clean the disc.
	Playback stops every time a chapter/track ends	• Press CONTINUOUS PLAY on the remote commander or AUTO PAUSE on the player to turn off the AUTO PAUSE button indicator on the player.
Picture	No picture, but the ▶ button indicator on the player lights up	• Connect the TV correctly. • Turn on the TV and set the input selector on the TV to "Video."
	Poor picture	• Connect the TV correctly. • Clean the disc.
	Visual noise while scanning a disc	• A certain amount of visual noise and instability is inevitable while scanning a disc.
	Freeze Frame does not operate	• Use a CAV disc. Freeze Frame does not operate on CLV LDs, CDVs or VSDs.
Sound	No sound	• Connect the TV or amplifier correctly. • Turn up the volume on the TV or amplifier. • Switch on the amplifier and set the input selector to "CD" or "AUX." • Playback at normal speed. No sound is output while in pause mode.
Others	Remote Commander does not operate	• Turn on the player. • Point the remote commander at the remote sensor on the player. • Remove any obstacles between the remote commander and the sensor. • Insert the batteries correctly. • Replace both the batteries with new ones if they are weak.

Optical discs

The MDP-A660K can play all three types of optical discs currently available for home entertainment, laser discs (LD, recorded in NTSC standard), compact discs (CD) and compact disc videos (CDV).*

Disc class	Disc logo	Disc type	Size	Sides	Play time	
Laser Discs For movies, operas, and concerts	LASER DISC	LD Single	8 in. (20 cm)	Single	CAV	14 min
					CLV	20 min
		8-inch LD	8 in. (20 cm)	Double	CAV	28 min
					CLV	40 min
		12-inch LD	12 in. (30 cm)	Double	CAV	1 hr
					CLV	2 hr
Compact Discs For music	COMPACT disc DIGITAL AUDIO	CD Single	3 in. (8 cm)	Single	20 min	
		CD	5 in. (12 cm)	Single	74 min	
Compact Disc Videos For music videos and educational material (Digital Audio)	CD VIDEO	CDV	5 in. (12 cm)	Single	Video+Audio 5 min Audio 20 min	
	VIDEO SINGLE DISC	VSD	5 in. (12 cm)	Single	Video+Audio 5 min	

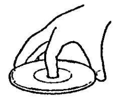
Multi audio discs

digital AUDIO MULTI AUDIO

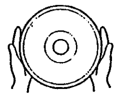
Discs with these logos contain separate analog and digital tracks which may differ in content.

* The MDP-A660K cannot play the following discs or functions:
- CED, VHD discs or PAL video discs
- CD-ROM, CD-GRAPHICS, VIDEO CD, Photo CD, CD-I discs
- Aluminum-lined discs or MD (MiniDisc) discs
- Graphic functions of LD-G discs

Optical Disc Maintenance



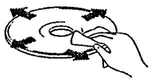
Holding CDs or CDVs
Hold CDs and CDVs by putting your index finger through the center hole and grasping the edge of the disc with the thumb and other fingers as pictured in the illustration.



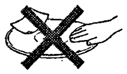
Holding LDs
Hold LDs by grasping the outside edge with both hands as illustrated.

Light exposure
Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave the disc in a car parked in direct sunlight where there can be a considerable rise in temperature.

Cracked or damaged discs
Do not play cracked or damaged discs, or try to play discs that have been repaired with adhesive glues.



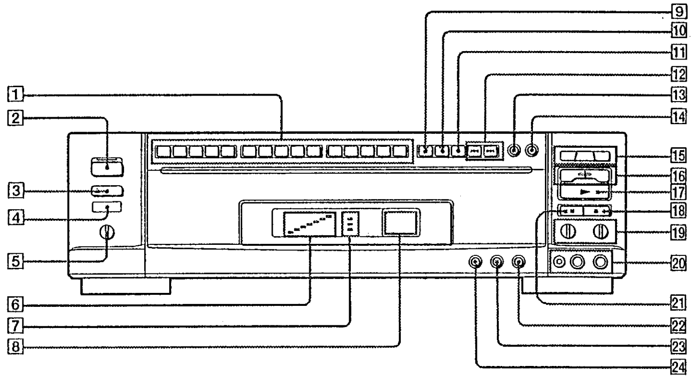
Keeping the disc surface clean
Clean the surface of the disc before playing, using a soft, dry, cleaning cloth. Wipe the disc from the center out. Do not use solvents such as benzine, paint thinner, commercially available cleaners, or anti-static spray intended for LP record discs.
To prevent marring, after playing, remove the disc and put it back into its jacket.
Putting your fingers on, or adhering anything to the surface of the disc such as sticky note pad paper or adhesive tape, will deteriorate the quality of the playing surface, and thus the output quality.



Index to parts and controls

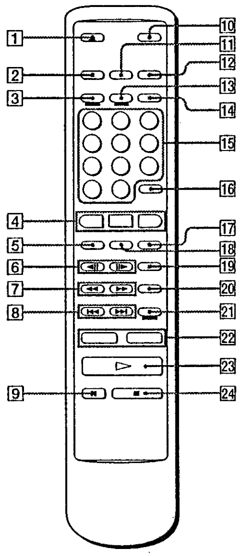
See the pages indicated in ( ) for details.

Front



1 Number buttons (11) (12) (22)
2 POWER switch and indicator (8)
  ON: Green
  STANDBY: Red
3 ≙ OPEN/CLOSE button (8)
4 Remote sensor (26)
5 ECHO LEVEL control (11)
6 KEY CONTROL indicators (16)
7 AUTO RESUME indicator (19)
  SURROUND indicator (16)
  KARAOKE PON indicator (17)
8 Chapter/track number indicator (9)
9 RESERVE button and indicator (12)
10 NEXT DISC RESERVE button and indicator (13)
11 CLEAR button (12) (23)
12 ⏮/⏭ ACS/AMS buttons (21)
13 VOCAL button (15)
14 SELECT button and indicator (15)
15 KEY CONTROL ♭ DOWN/NATURAL/♯ UP indicator-buttons (16)
16 SIDE A/B buttons and indicators (9)
17 ► (Play) button and indicator (8)
18 ■ (Stop) button (8)
19 MIC LEVEL 1/2 controls (10)
20 MIC 1/2 and CONTROL (MIC 1/2) jacks (10)
21 ❚❚ (Pause) button and indicator (8)
22 LINE IN button and indicator (18)
23 VOCAL SUPPORT button and indicator (17)
24 AUTO PAUSE button and indicator (11)

Remote commander

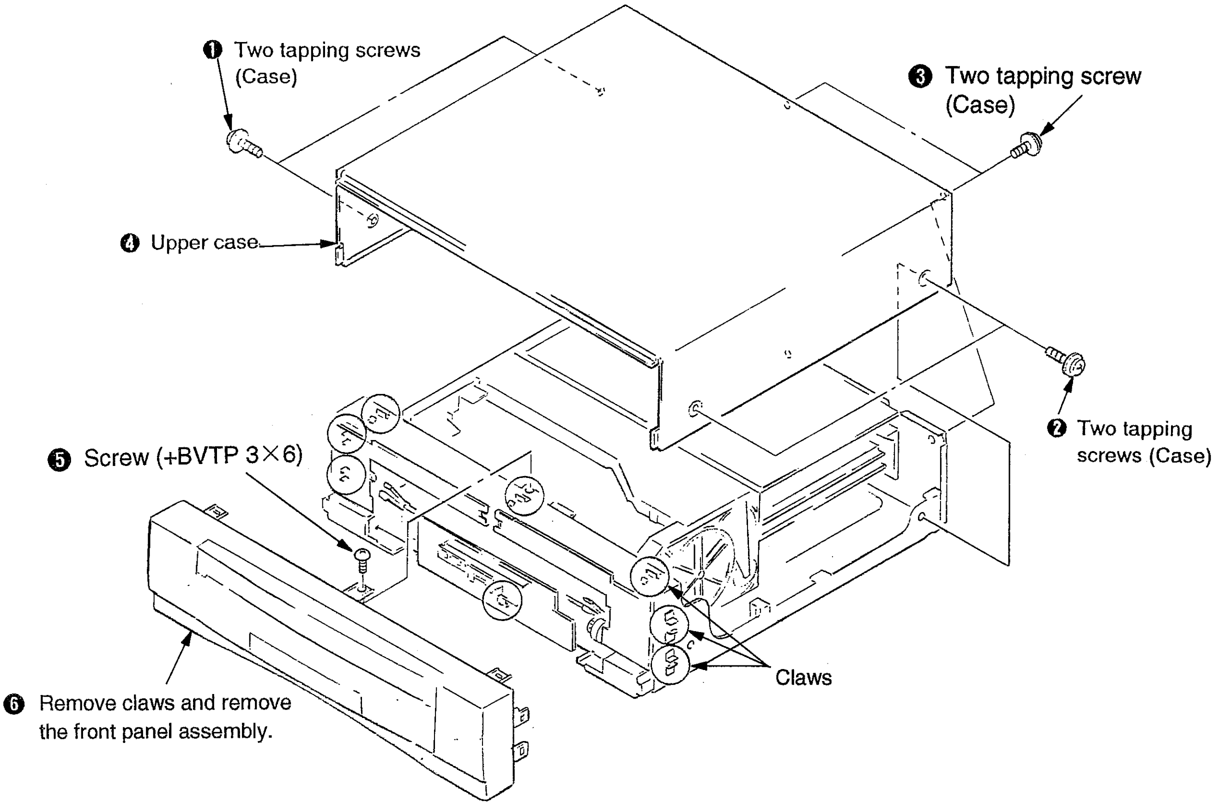


1 ≙ OPEN/CLOSE button (8)
2 ANALOG/D⊠ button (25)
3 RESERVE button (12)
4 KEY CONTROL buttons (16)
  ♯ UP
  ♮ NATURAL
  ♭ DOWN
5 VOCAL button (15)
6 ◄❚❚/❚❚► STILL/STEP buttons (24)
7 ◄◄/►► SCAN buttons (21)
8 ⏮/⏭ ACS/AMS buttons (21)
9 ❚❚ PAUSE button (8)
10 POWER switch (8)
11 AUDIO MONITOR button (25)
12 DISPLAY button (20)
13 NEXT DISC RESERVE button (13)
14 CLEAR button (12) (23)
15 Number buttons (11) (12) (22)
16 CONTINUOUS PLAY button (11)
17 KARAOKE PON button (17)
18 SELECT button (15)
19 VOCAL SUPPORT button (17)
20 SURROUND button (16)
21 REPEAT button (23)
22 DISC SIDE A/B buttons (9)
23 ▷ PLAY button (8)
24 ■ STOP button (8)

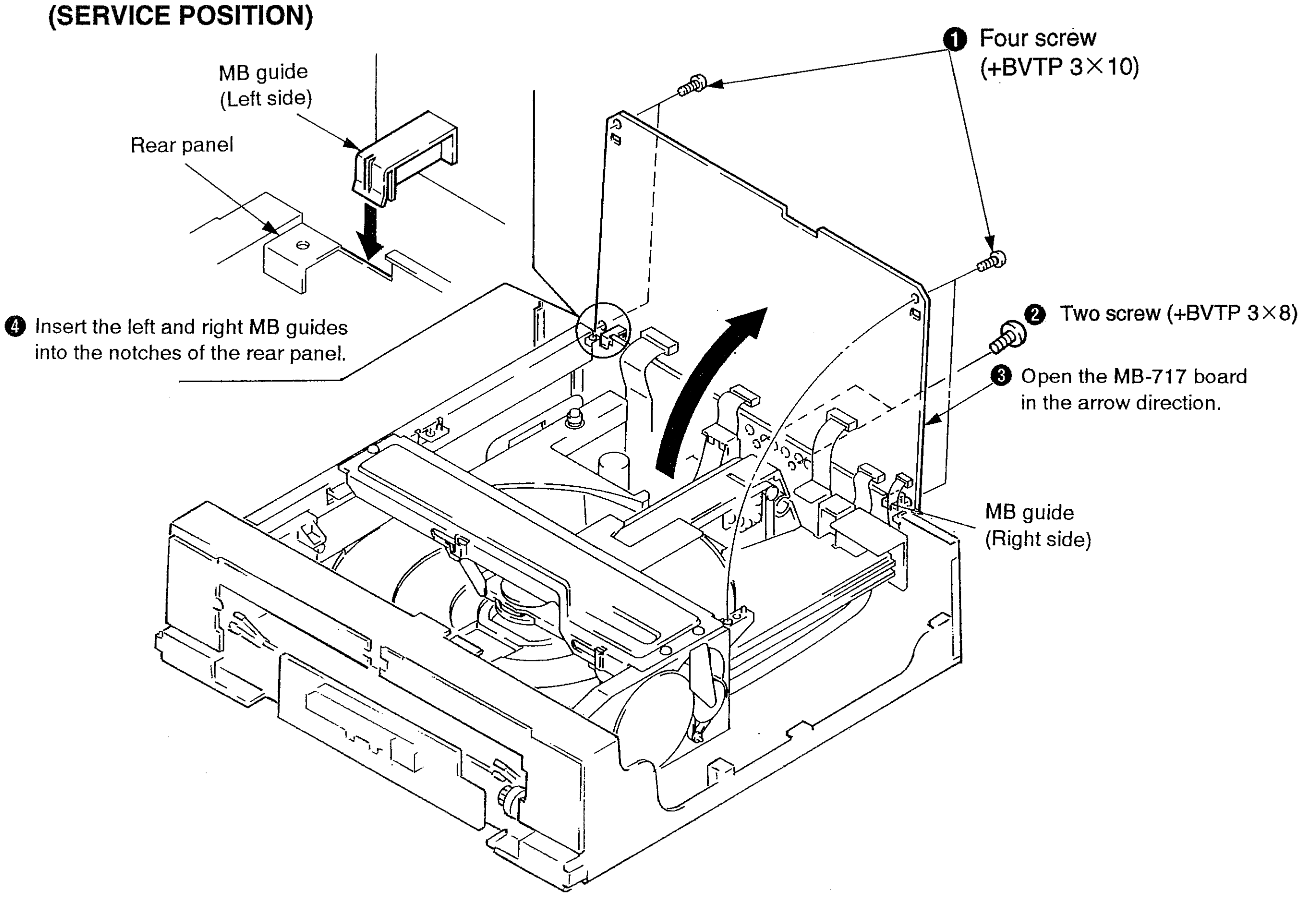
A function activated by pressing a button with an orange mark can be canceled by pressing the CLEAR button.

SECTION 2
DISASSEMBLY

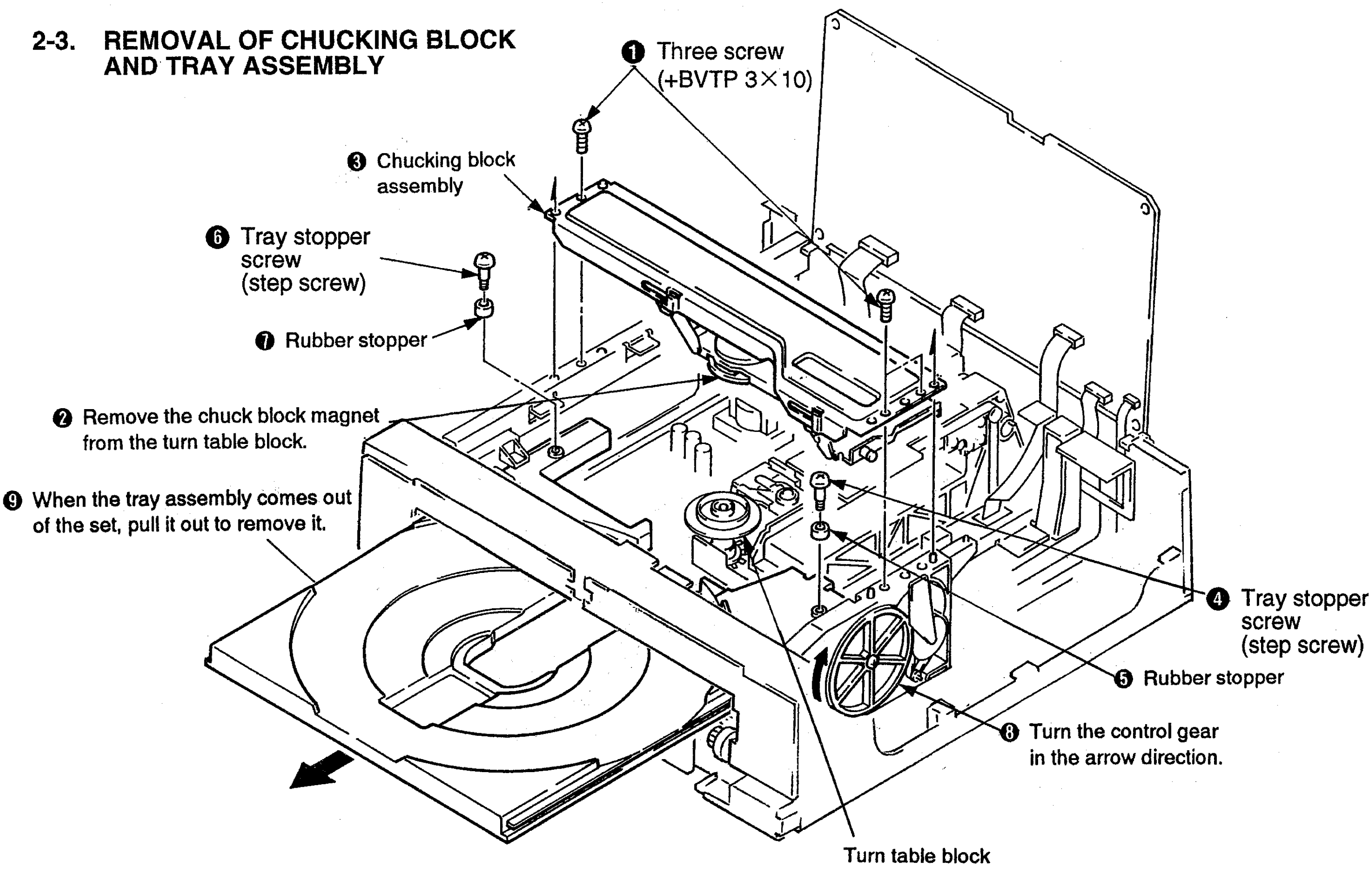
2-1. REMOVAL OF FRONT PANEL ASSEMBLY


❶ Two tapping screws (Case)
❸ Two tapping screw (Case)
❹ Upper case
❷ Two tapping screws (Case)
❺ Screw (+BVTP 3×6)
Claws
❻ Remove claws and remove the front panel assembly.

2-2. OPENING OF MB-717 BOARD (SERVICE POSITION)


MB guide (Left side)
Rear panel
❶ Four screw (+BVTP 3×10)
❷ Two screw (+BVTP 3×8)
❸ Open the MB-717 board in the arrow direction.
❹ Insert the left and right MB guides into the notches of the rear panel.
MB guide (Right side)

2-3. REMOVAL OF CHUCKING BLOCK AND TRAY ASSEMBLY



❶ Three screw (+BVTP 3×10)

❷ Remove the chuck block magnet from the turn table block.

❸ Chucking block assembly

❹ Tray stopper screw (step screw)

❺ Rubber stopper

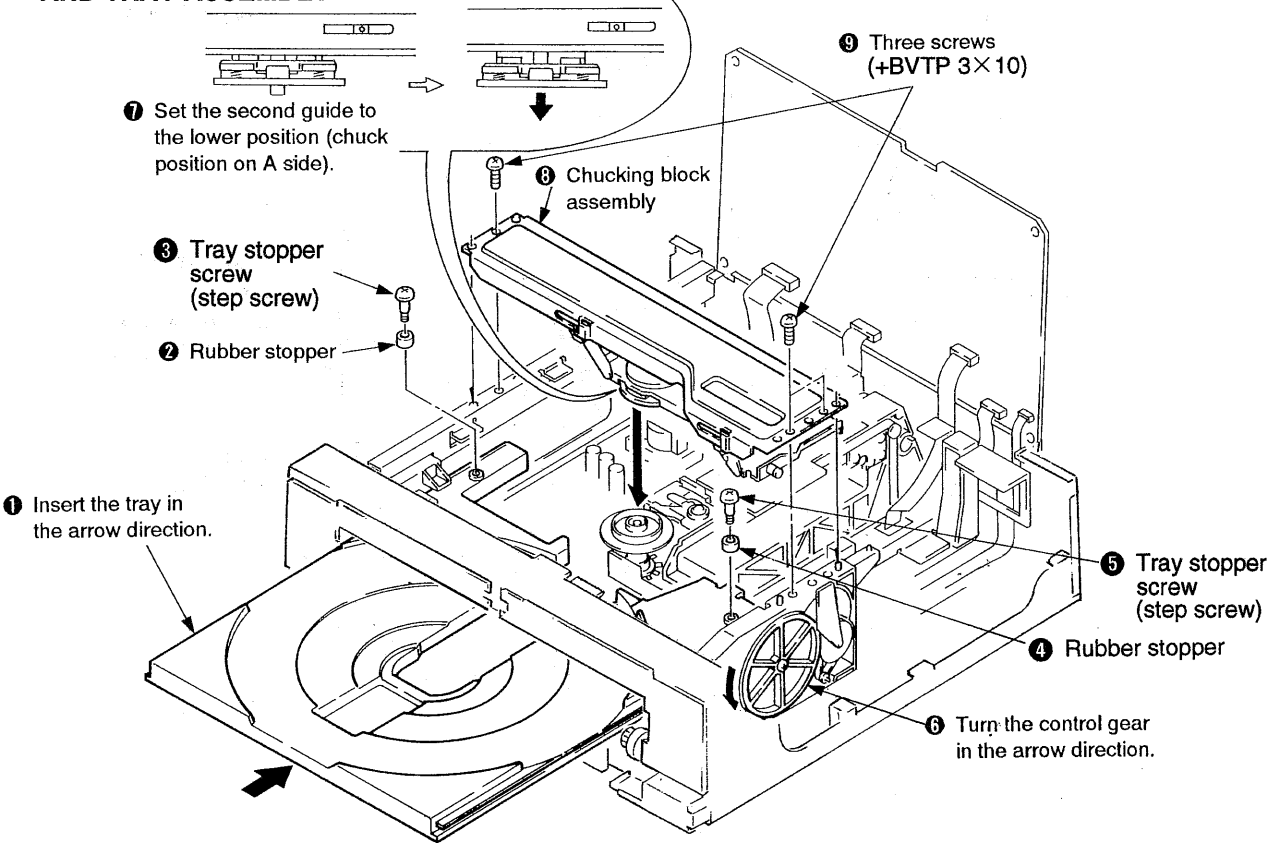
❻ Tray stopper screw (step screw)

❼ Rubber stopper

❽ Turn the control gear in the arrow direction.

❾ When the tray assembly comes out of the set, pull it out to remove it.

2-4. MOUNTING THE CHUCKING BLOCK AND TRAY ASSEMBLY



❶ Insert the tray in the arrow direction.

❷ Rubber stopper

❸ Tray stopper screw (step screw)

❹ Rubber stopper

❺ Tray stopper screw (step screw)

❻ Turn the control gear in the arrow direction.

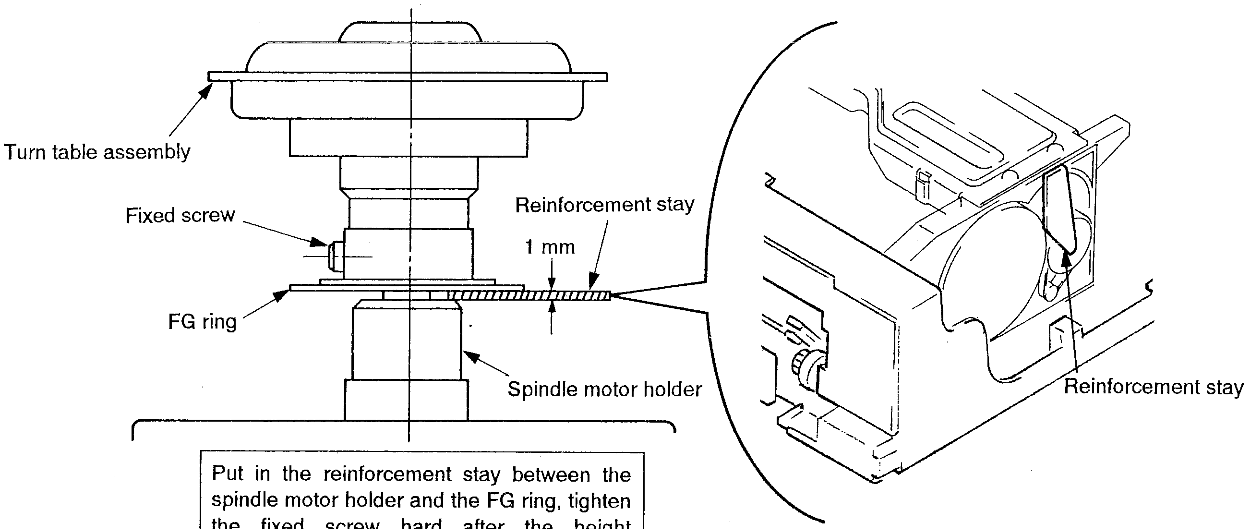
❼ Set the second guide to the lower position (chuck position on A side).

❽ Chucking block assembly

❾ Three screws (+BVTP 3×10)

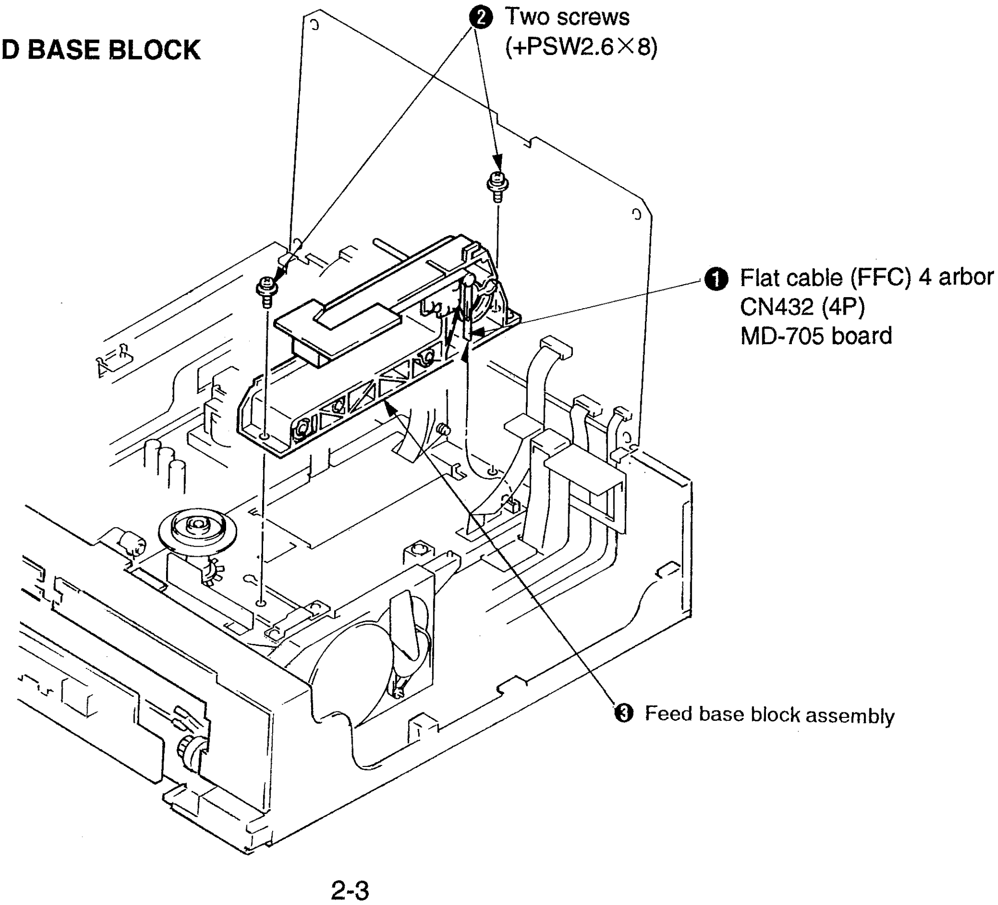
2-5. HEIGHT ADJUSTMENT OF THE TURN TABLE ASSEMBLY

1. Rotate the control gear on the right side of the set, and open the tray.
2. Remove the chucking, block assembly.
3. Remove the reinforcement stay.
4. Change the turn table assembly.
   Adjust the height and also the position putting in the reinforcement stay as below.
   The thickness of the reinforcement is 1 mm.
5. Fix the reinforcement to fixed position.

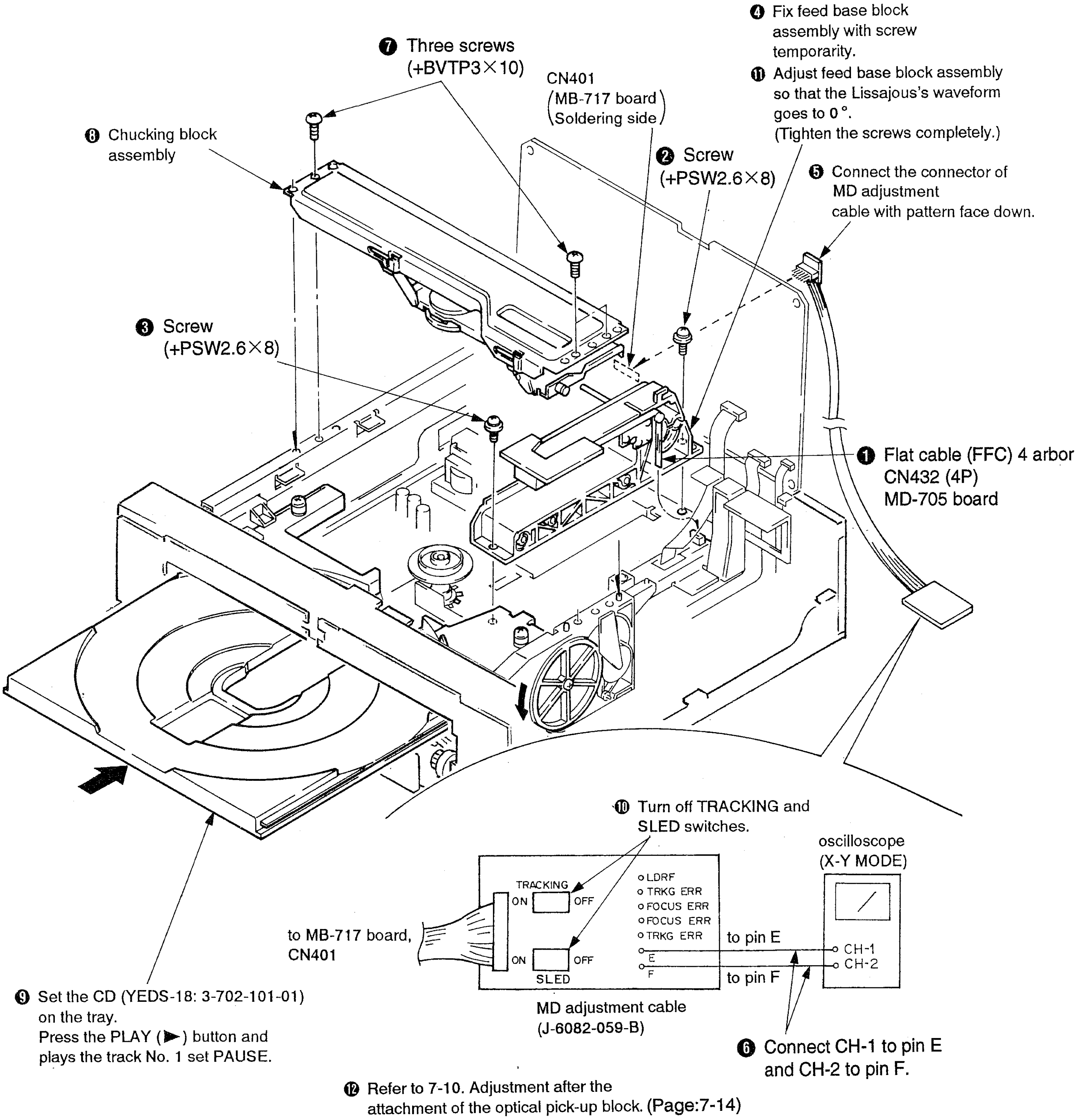

Turn table assembly
Fixed screw
Reinforcement stay
1 mm
FG ring
Spindle motor holder
Reinforcement stay

Put in the reinforcement stay between the spindle motor holder and the FG ring, tighten the fixed screw hard after the height adjustment.

2-6. REMOVAL OF FEED BASE BLOCK ASSEMBLY


❷ Two screws
(+PSW2.6×8)
❶ Flat cable (FFC) 4 arbor
CN432 (4P)
MD-705 board
❸ Feed base block assembly

2-7. MOUNTING THE FEED BASE BLOCK ASSEMBLY


CN401
(MB-717 board
Soldering side)
TRACKING
ON
OFF
ON
OFF
SLED
o LDRF
o TRKG ERR
o FOCUS ERR
o FOCUS ERR
o TRKG ERR
E
F
to MB-717 board,
CN401
to pin E
to pin F
oscilloscope
(X-Y MODE)
CH-1
CH-2
MD adjustment cable
(J-6082-059-B)

❶ Flat cable (FFC) 4 arbor CN432 (4P) MD-705 board

❷ Screw (+PSW2.6×8)

❸ Screw (+PSW2.6×8)

❹ Fix feed base block assembly with screw temporarity.

❺ Connect the connector of MD adjustment cable with pattern face down.

❻ Connect CH-1 to pin E and CH-2 to pin F.

❼ Three screws (+BVTP3×10)

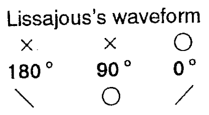
❽ Chucking block assembly

❾ Set the CD (YEDS-18: 3-702-101-01) on the tray.
Press the PLAY (▶) button and plays the track No. 1 set PAUSE.

❿ Turn off TRACKING and SLED switches.

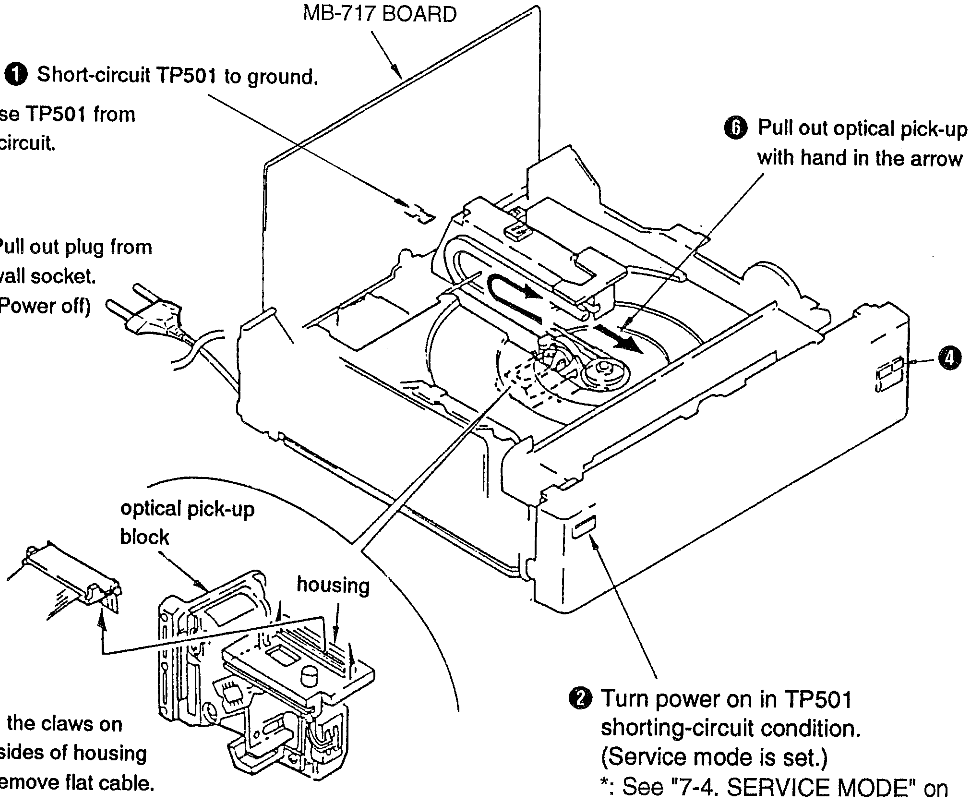
⓫ Adjust feed base block assembly so that the Lissajous's waveform goes to 0 °.
(Tighten the screws completely.)

⓬ Refer to 7-10. Adjustment after the attachment of the optical pick-up block. (Page:7-14)


Lissajous's waveform
×
×
○
180 °
90 °
0 °

2-8. OPTICAL PICK-UP BLOCK

- **DISASSEMBLE I**
  (OPTICAL PICK-UP BLOCK MOTOR OPERATES)



❶ Short-circuit TP501 to ground.

❷ Turn power on in TP501 shorting-circuit condition. (Service mode is set.)
*: See "7-4. SERVICE MODE" on page 7-2 for the service mode.

❸ Release TP501 from short-circuit.

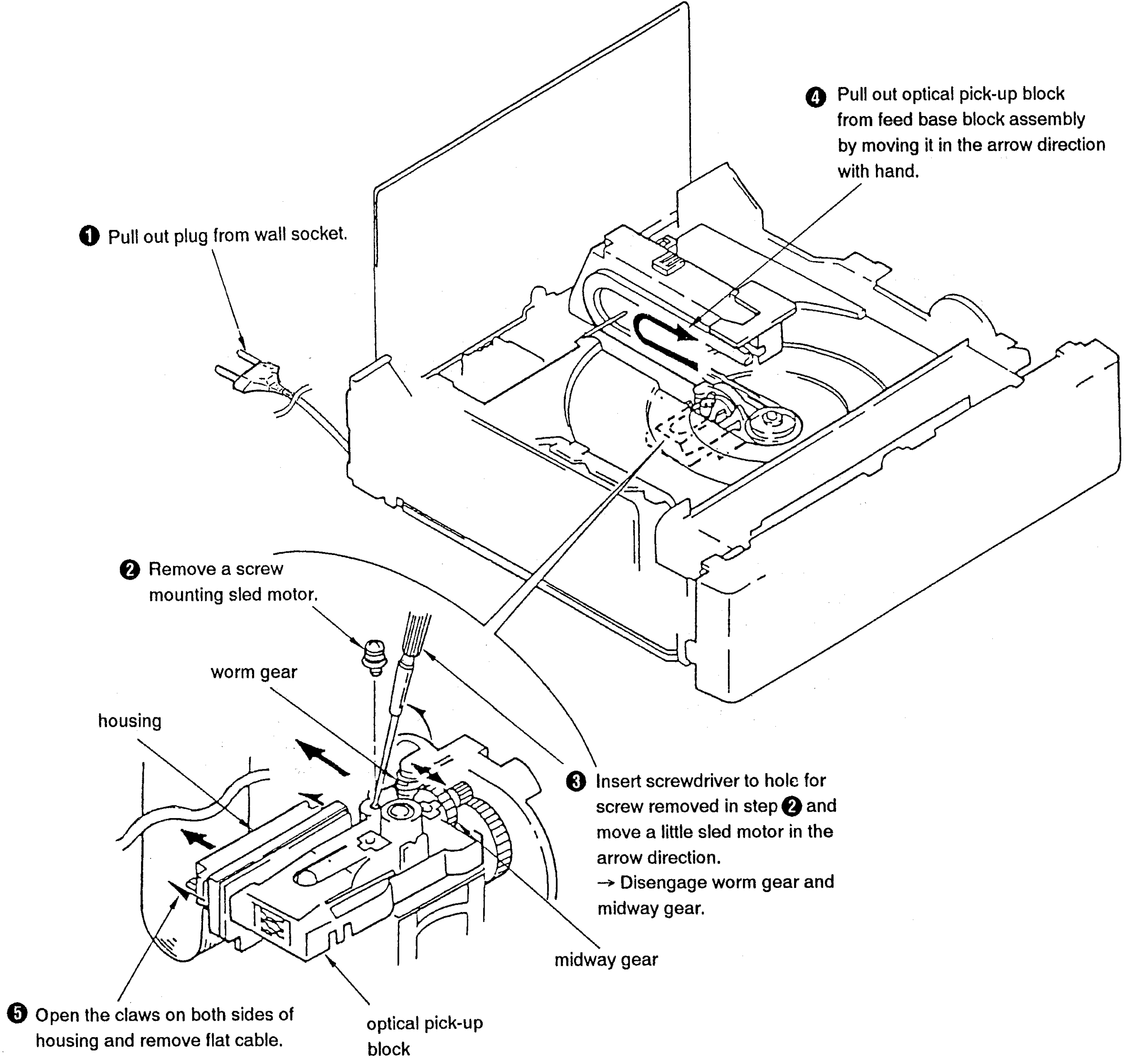
❹ Keep pushing SIDE B button to move optical pick-up block to upper and front side.

❺ Pull out plug from wall socket. (Power off)

❻ Pull out optical pick-up block with hand in the arrow direction.

❼ Open the claws on both sides of housing and remove flat cable.

• DISASSEMBLE Ⅱ
(OPTICAL PICK-UP BLOCK MOTOR DOESN'T OPERATE)



❶ Pull out plug from wall socket.

❷ Remove a screw mounting sled motor.

❸ Insert screwdriver to hole for screw removed in step ❷ and move a little sled motor in the arrow direction.
→ Disengage worm gear and midway gear.

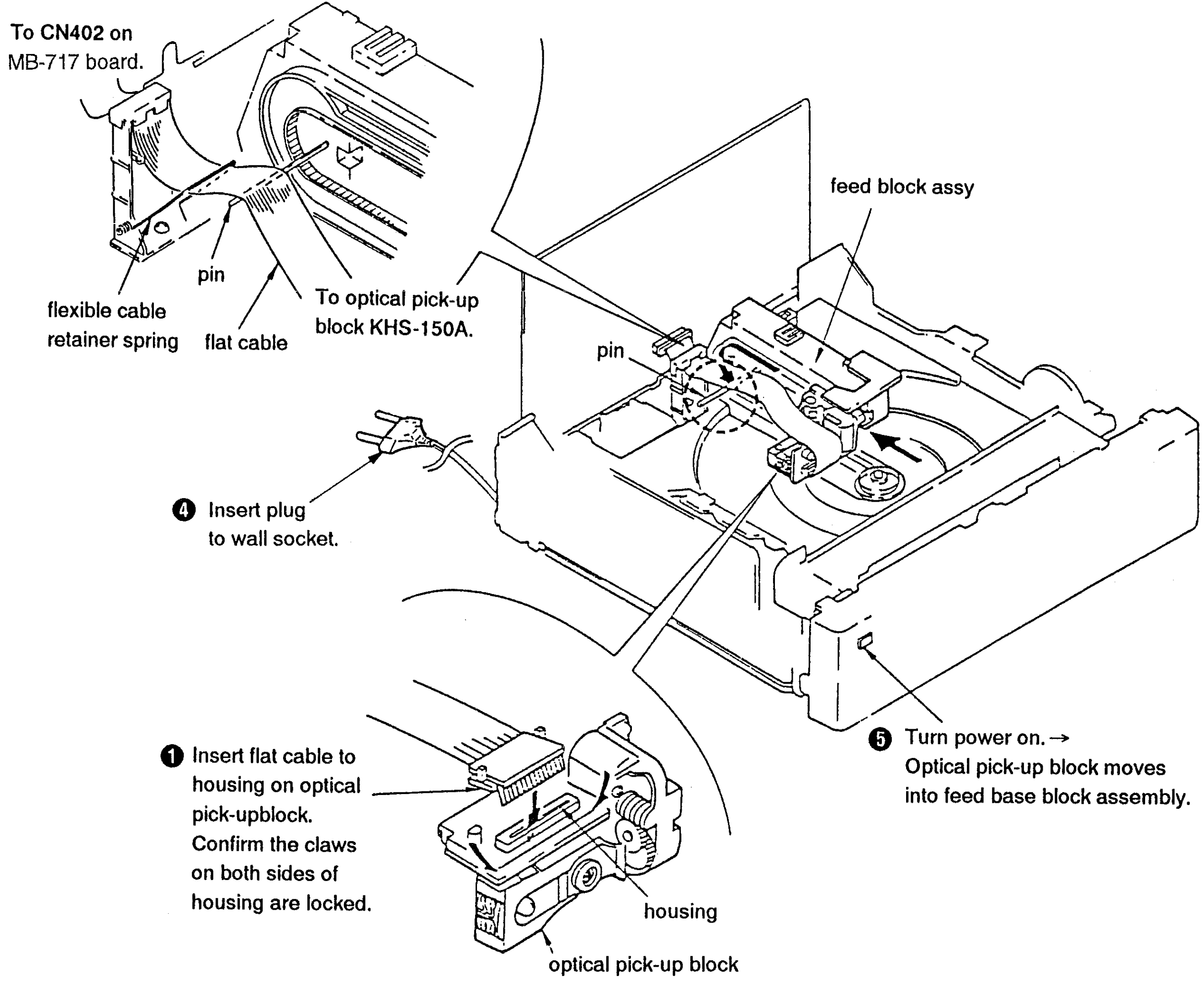
❹ Pull out optical pick-up block from feed base block assembly by moving it in the arrow direction with hand.

❺ Open the claws on both sides of housing and remove flat cable.

worm gear
housing
midway gear
optical pick-up block

• ASSEMBLE

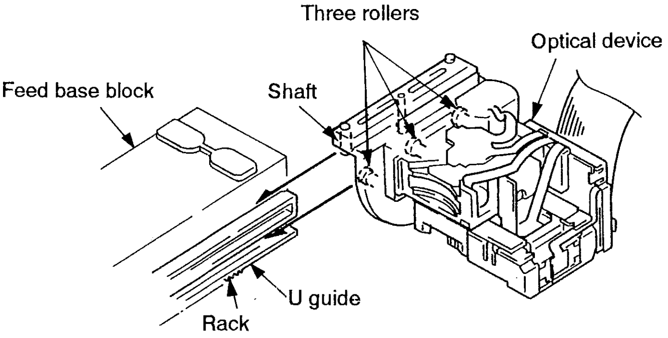
❸ Confirm the flat cable goes through the flexible cable retainer spring and over the pin.


To CN402 on
MB-717 board.
pin
flexible cable
retainer spring
flat cable
To optical pick-up
block KHS-150A.
feed block assy
pin
housing
optical pick-up block

❹ Insert plug to wall socket.

❶ Insert flat cable to housing on optical pick-upblock. Confirm the claws on both sides of housing are locked.

❺ Turn power on. → Optical pick-up block moves into feed base block assembly.


Three rollers
Optical device
Feed base block
Shaft
U guide
Rack

❷ Insert optical pick-up block to feed base block assembly.

- Mounting

1) Insert the shaft and three rollers of the optical device into their corresponding grooves of the U guide.
2) Set so that the gear of the optical device engages with the rack of the U guide.

2-9. REMOVAL OF CONTROL GEAR

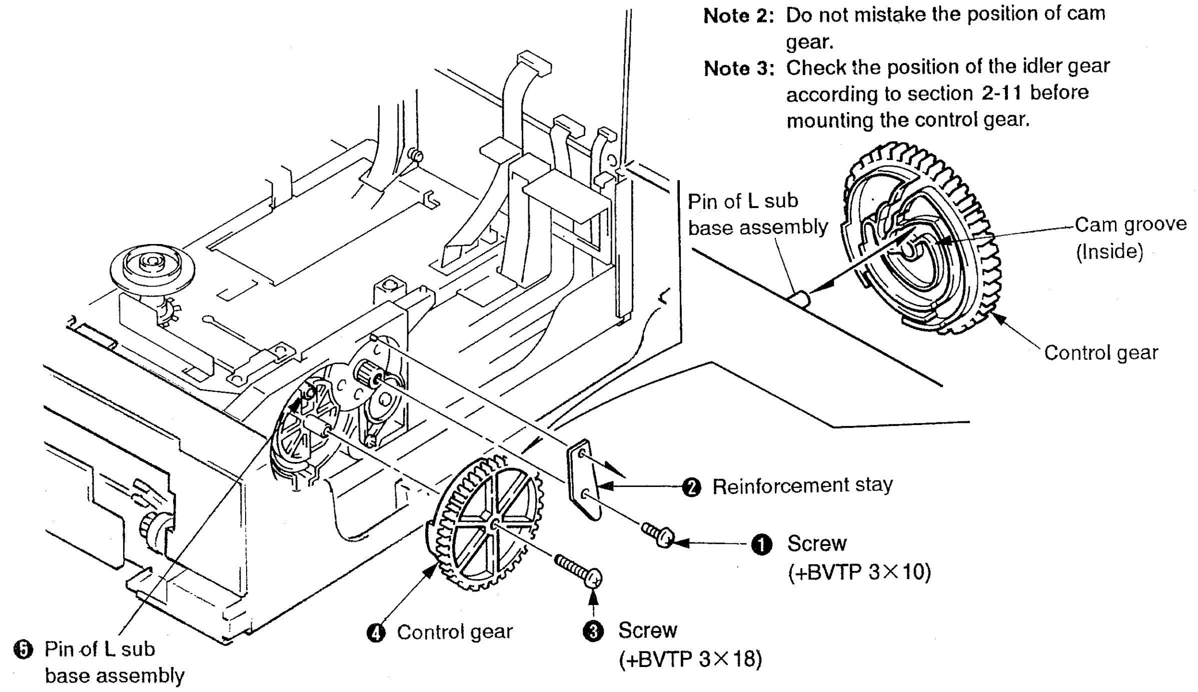
- Mounting the control gear

Lower the pin of the L sub base assembly completely and insert the pin into the cam groove (inside) of the control gear.

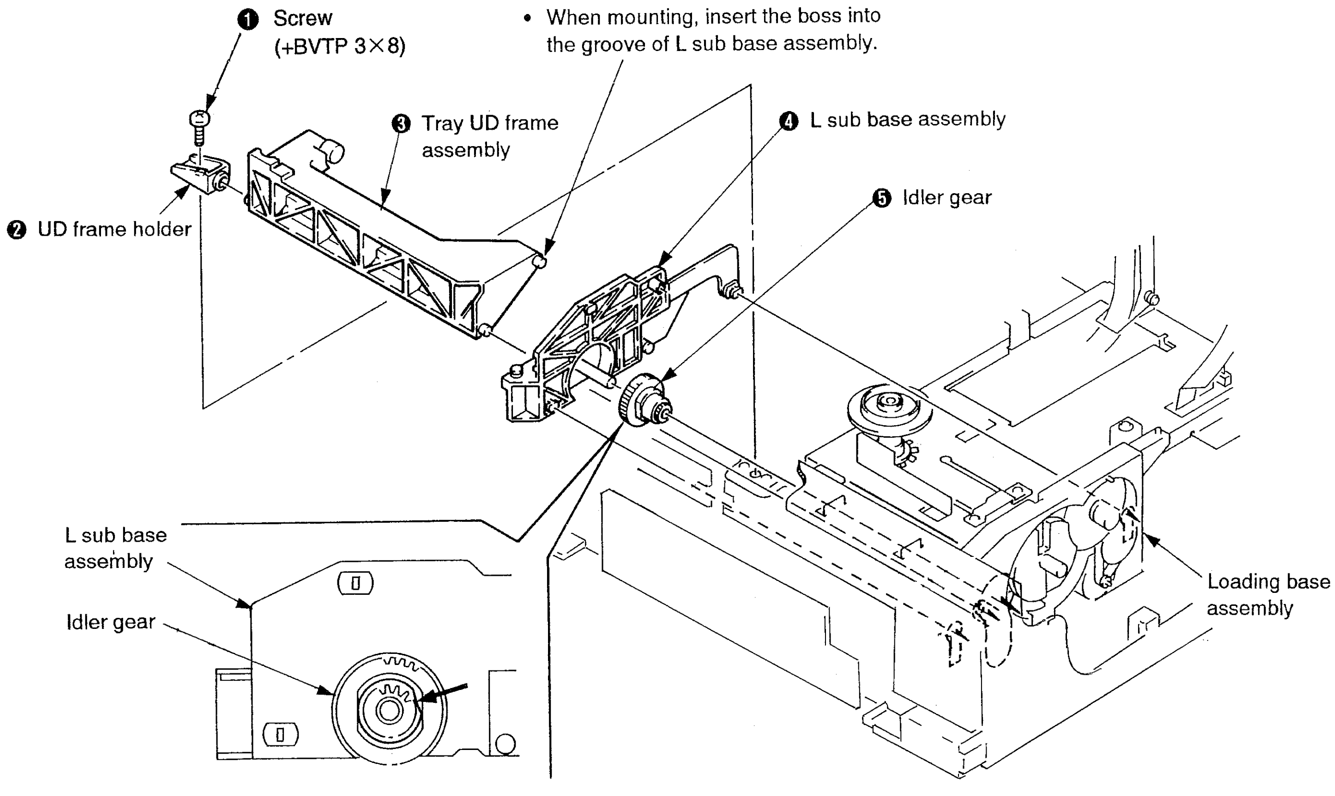
Note 1: Apply grease on the cam groove.

Note 2: Do not mistake the position of cam gear.

Note 3: Check the position of the idler gear according to section 2-11 before mounting the control gear.


Pin of L sub base assembly
Cam groove (Inside)
Control gear
❷ Reinforcement stay
❶ Screw (+BVTP 3×10)
❺ Pin of L sub base assembly
❹ Control gear
❸ Screw (+BVTP 3×18)

2-10. REMOVAL OF IDLER GEAR


❶ Screw (+BVTP 3×8)
❸ Tray UD frame assembly
❹ L sub base assembly
❺ Idler gear
❷ UD frame holder
L sub base assembly
Idler gear
Loading base assembly

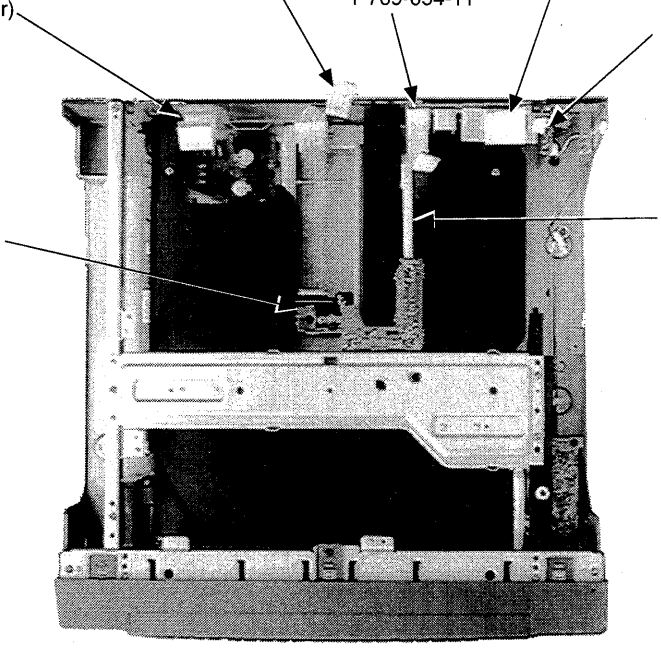
- When mounting, insert the boss into the groove of L sub base assembly.

- Positioning the idler gear

Mount the idler gear with its notch faced upper right (indicated by the arrow).

2-11. INTERNAL VIEWS

—Top View—


Flexible Flat cable (18 core)
1-751-083-11

Flat cable (23 arbor)
1-769-655-11

Flat cable (12 arbor)
1-769-654-11

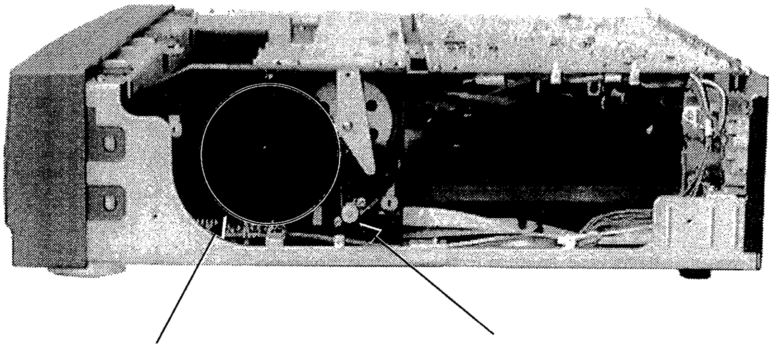
Flat cable (19 arbor)
1-769-652-11

Flat cable (7 arbor)
1-769-653-11

Flat cable (4 arbor)
1-769-680-11

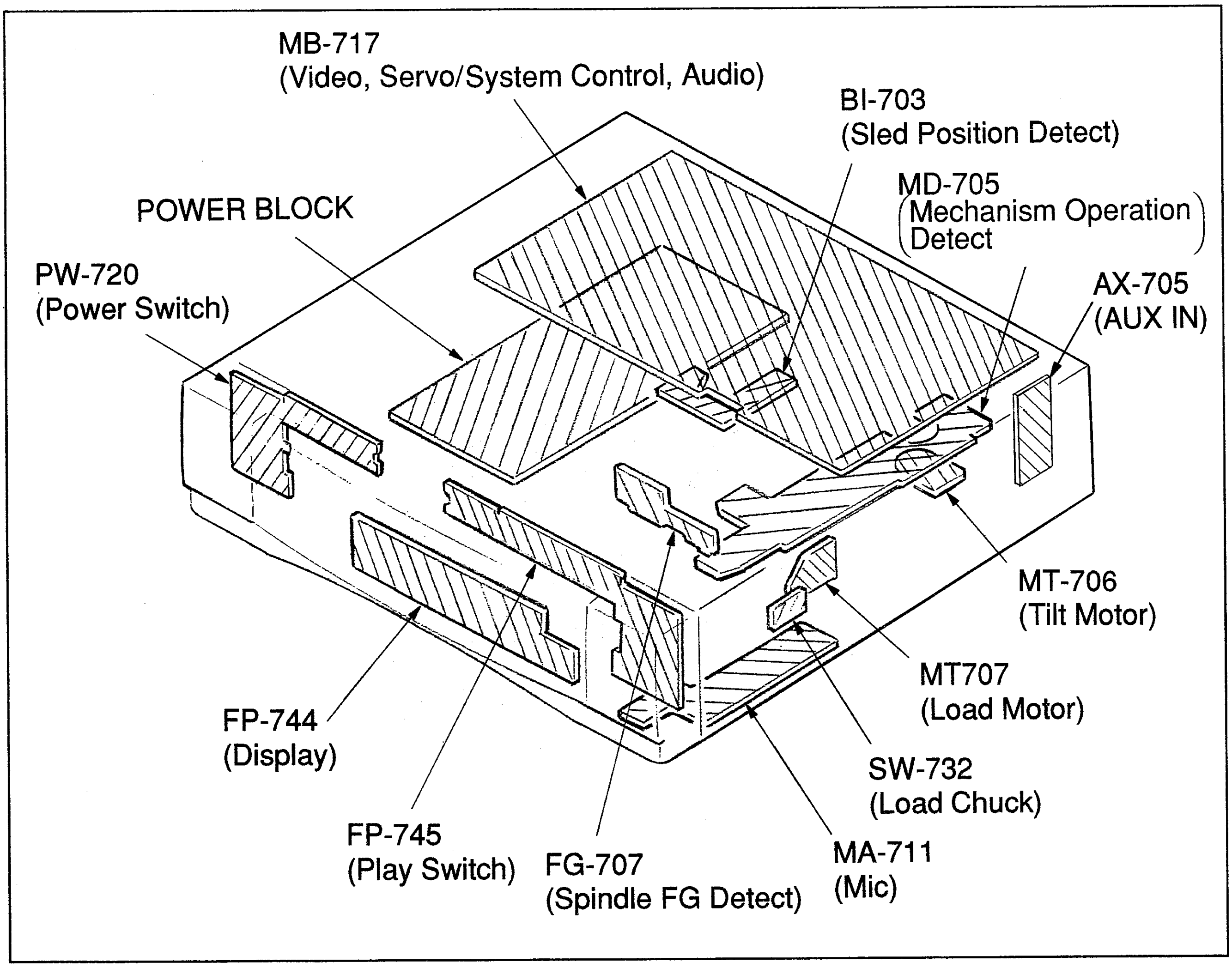
Optical device
(KHS-150A)
8-848-286-11

—Side View—


Control gear
3-961-083-01

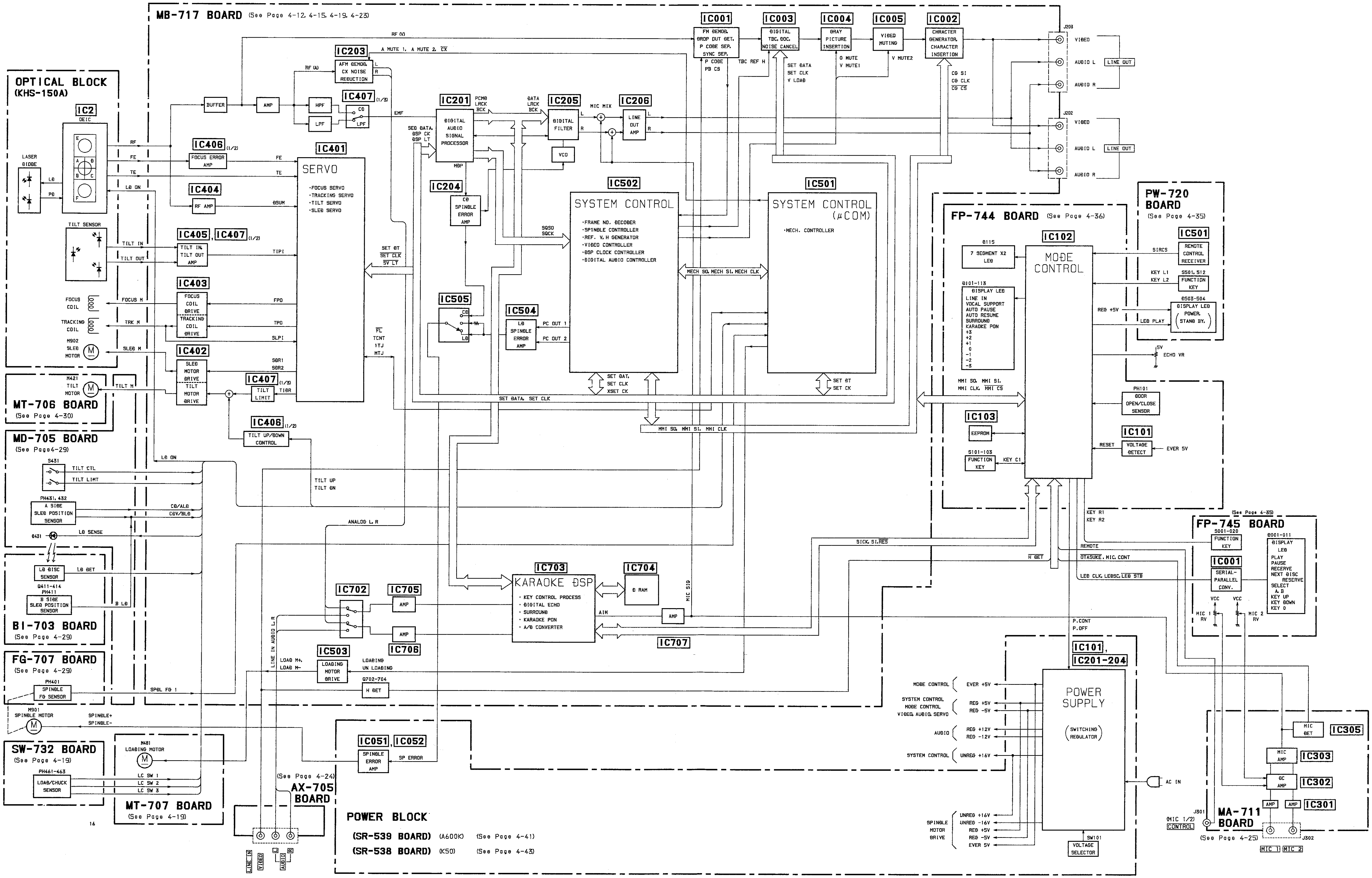
M481
Loading motor (RF-370C)
1-541-309-11

2-12. CIRCUIT BOARDS LOCATION

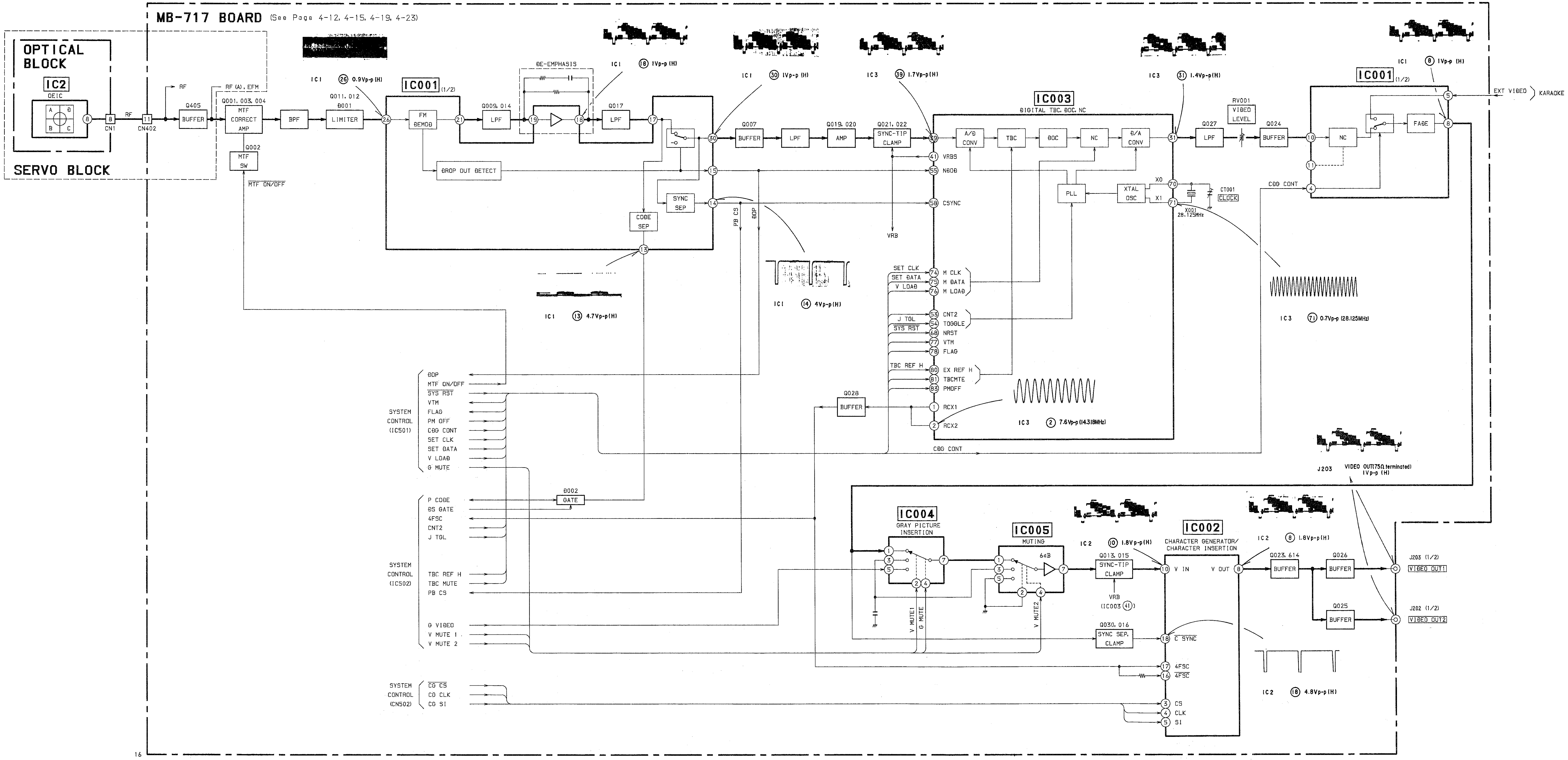

MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
MD-705
(Mechanism Operation Detect)
POWER BLOCK
PW-720
(Power Switch)
AX-705
(AUX IN)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-744
(Display)
SW-732
(Load Chuck)
FP-745
(Play Switch)
FG-707
(Spindle FG Detect)
MA-711
(Mic)

SECTION 3
BLOCK DIAGRAMS

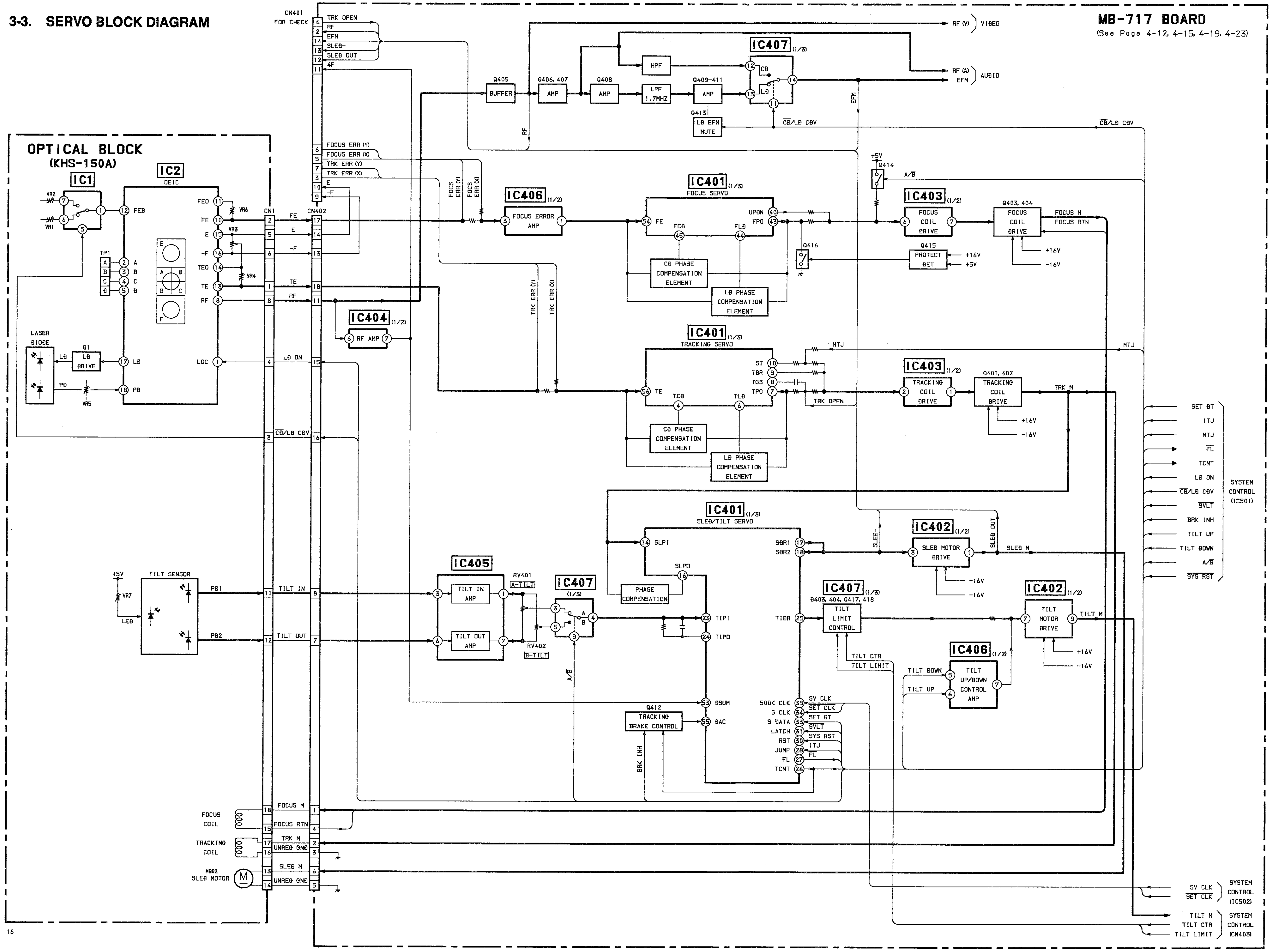
3-1. OVERALL BLOCK DIAGRAM


MB-717 BOARD (See Page 4-12, 4-15, 4-19, 4-23)
OPTICAL BLOCK (KHS-150A)
IC2 OEIC
LASER DIODE
LD
PD
TILT SENSOR
FOCUS COIL
TRACKING COIL
M902 SLED MOTOR
IC406 (1/2) FOCUS ERROR AMP
IC404 RF AMP
IC405, IC407 (1/2) TILT IN, TILT OUT AMP
IC403 FOCUS COIL DRIVE TRACKING COIL DRIVE
IC402 SLED MOTOR DRIVE TILT MOTOR DRIVE
IC407 (1/3) TILT LIMIT
IC406 (1/2) TILT UP/DOWN CONTROL
IC401 SERVO
·FOCUS SERVO
·TRACKING SERVO
·TILT SERVO
·SLED SERVO
BUFFER
AMP
HPF
LPF
IC407 (1/3)
IC203 AFM DEMOD. CX NOISE REDUCTION
A MUTE 1, A MUTE 2, CX
RF (V)
RF (A)
EMF
IC201 DIGITAL AUDIO SIGNAL PROCESSOR
IC205 DIGITAL FILTER
VCO
MIC MIX
IC206 LINE OUT AMP
IC204 CD SPINDLE ERROR AMP
IC505
IC504 LD SPINDLE ERROR AMP
PC OUT 1
PC OUT 2
IC001 FM DEMOD. DROP OUT DET. P CODE SEP. SYNC SEP.
IC003 DIGITAL TBC, DOC, NOISE CANCEL
IC004 GRAY PICTURE INSERTION
IC005 VIDEO MUTING
IC002 CHARACTER GENERATOR, CHARACTER INSERTION
J203
J202
VIDEO
AUDIO L
AUDIO R
LINE OUT
IC502 SYSTEM CONTROL
·FRAME NO. DECODER
·SPINDLE CONTROLLER
·REF. V, H GENERATOR
·VIDEO CONTROLLER
·DSP CLOCK CONTROLLER
·DIGITAL AUDIO CONTROLLER
IC501 SYSTEM CONTROL (μCOM)
·MECH. CONTROLLER
MECH SO, MECH SI, MECH CLK
SET DATA, SET CLK
MMI SO, MMI SI, MMI CLK
IC703 KARAOKE DSP
· KEY CONTROL PROCESS
· DIGITAL ECHO
· SURROUND
· KARAOKE PON
· A/D CONVERTER
IC704 D RAM
IC702
IC705 AMP
IC706 AMP
IC707 AMP
IC503 LOADING MOTOR DRIVE
Q702-704 H DET
MT-706 BOARD (See Page 4-30)
M421 TILT MOTOR
MD-705 BOARD (See Page 4-29)
S431
TILT CTL
TILT LIMT
PH431, 432 A SIDE SLED POSITION SENSOR
D431
LD SENSE
LD DISC SENSOR
Q411-414 PH411 B SIDE SLED POSITION SENSOR
BI-703 BOARD (See Page 4-29)
FG-707 BOARD (See Page 4-29)
PH401 SPINDLE FG SENSOR
M901 SPINDLE MOTOR
SW-732 BOARD (See Page 4-19)
PH461-463 LOAD/CHUCK SENSOR
MT-707 BOARD (See Page 4-19)
M481 LOADING MOTOR
(See Page 4-24) AX-705 BOARD
LINE IN
VIDEO
AUDIO L R
IC051, IC052 SPINDLE ERROR AMP
SP ERROR
FP-744 BOARD (See Page 4-36)
D115 7 SEGMENT X2 LED
D101-113 DISPLAY LED
IC102 MODE CONTROL
IC103 EEPROM
S101-103 FUNCTION KEY
IC101 VOLTAGE DETECT
RESET
EVER 5V
PH101 DOOR OPEN/CLOSE SENSOR
PW-720 BOARD (See Page 4-35)
IC501 REMOTE CONTROL RECEIVER
S501, 512 FUNCTION KEY
D503-504 DISPLAY LED POWER, STAND BY
ECHO VR
FP-745 BOARD (See Page 4-35)
S001-020 FUNCTION KEY
D001-011 DISPLAY LED
IC001 SERIAL-PARALLEL CONV.
MIC 1 RV
MIC 2 RV
POWER BLOCK
(SR-539 BOARD) (A600K) (See Page 4-41)
(SR-538 BOARD) (K50) (See Page 4-43)
IC101, IC201-204
POWER SUPPLY (SWITCHING REGULATOR)
SW101 VOLTAGE SELECTOR
AC IN
MA-711 BOARD (See Page 4-25)
IC305 MIC DET
IC303 MIC AMP
IC302 DC AMP
IC301 AMP
J301 (MIC 1/2) CONTROL
J302
MIC 1
MIC 2

3-2. VIDEO BLOCK DIAGRAM

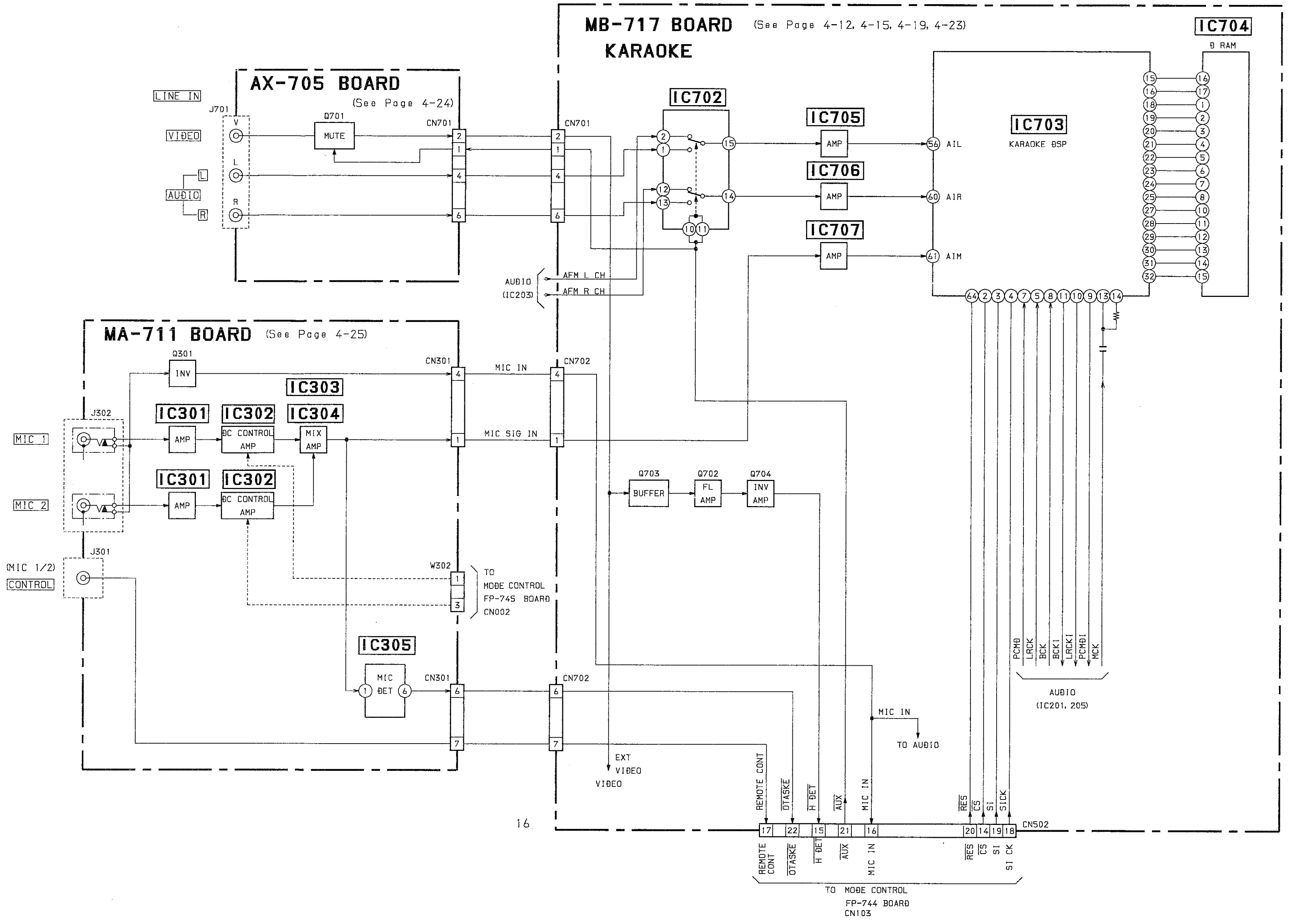

MB-717 BOARD (See Page 4-12, 4-15, 4-19, 4-23)
OPTICAL BLOCK
IC2
OEIC
A
Đ
B
C
8
8
CN1
RF
11
CN402
SERVO BLOCK
RF
RF (A), EFM
Q405
BUFFER
Q001, 003, 004
MTF CORRECT AMP
Q002
MTF SW
MTF ON/OFF
BPF
Q011, 012
Đ001
LIMITER
IC1
26 0.9Vp-p (H)
IC001 (1/2)
26
FM ĐEMOĐ
21
Q009, 014
LPF
ĐE-EMPHASIS
19
18
IC1
18 1Vp-p (H)
Q017
LPF
17
ĐROP OUT ĐETECT
CODE SEP
SYNC SEP
30
15
14
13
IC1
13 4.7Vp-p (H)
PB CS
ĐOP
IC1
14 4Vp-p (H)
IC1
30 1Vp-p (H)
Q007
BUFFER
LPF
Q019, 020
AMP
Q021, 022
SYNC-TIP CLAMP
IC3
39 1.7Vp-p (H)
VRB
IC003
ĐIGITAL TBC, ĐOC, NC
39
41 VRBS
55 NĐOĐ
58 CSYNC
A/Đ CONV
TBC
ĐOC
NC
Đ/A CONV
PLL
XTAL OSC
X0
X1
70
71
X001 28.125MHz
CT001 CLOCK
31
IC3
31 1.4Vp-p (H)
SET CLK
SET ĐATA
V LOAĐ
74 M CLK
75 M ĐATA
76 M LOAĐ
J TGL
SYS RST
53 CNT2
54 TOGGLE
68 NRST
77 VTM
78 FLAG
TBC REF H
80 EX REF H
81 TBCMTE
83 PMOFF
1 RCX1
2 RCX2
Q028
BUFFER
IC3
2 7.6Vp-p (14.318MHz)
CĐG CONT
Q027
LPF
RV001
VIĐEO LEVEL
Q024
BUFFER
IC001 (1/2)
IC1
8 1Vp-p (H)
10
11
4
5
8
NC
FAĐE
CĐG CONT
EXT VIĐEO
KARAOKE
IC3
71 0.7Vp-p (28.125MHz)
J203
VIDEO OUT(75Ω terminated) 1Vp-p (H)
SYSTEM CONTROL (IC501)
ĐOP
MTF ON/OFF
SYS RST
VTM
FLAG
PM OFF
CĐG CONT
SET CLK
SET ĐATA
V LOAĐ
G MUTE
P COĐE
ĐS GATE
4FSC
CNT2
J TGL
Đ002
GATE
SYSTEM CONTROL (IC502)
TBC REF H
TBC MUTE
PB CS
G VIĐEO
V MUTE 1
V MUTE 2
SYSTEM CONTROL (CN502)
CG CS
CG CLK
CG SI
IC004
GRAY PICTURE INSERTION
1
3
5
7
2
4
V MUTE1
G MUTE
IC005
MUTING
6dB
1
3
5
7
2
4
V MUTE2
IC2
10 1.8Vp-p (H)
Q013, 015
SYNC-TIP CLAMP
VRB (IC003 41)
Q030, 016
SYNC SEP, CLAMP
IC002
CHARACTER GENERATOR/ CHARACTER INSERTION
10 V IN
V OUT 8
18 C SYNC
17 4FSC
16 4FSC
3 CS
4 CLK
5 SI
IC2
8 1.8Vp-p (H)
Q023, 614
BUFFER
Q026
BUFFER
Q025
BUFFER
J203 (1/2)
VIĐEO OUT1
J202 (1/2)
VIĐEO OUT2
IC2
18 4.8Vp-p (H)
16

3-3. SERVO BLOCK DIAGRAM



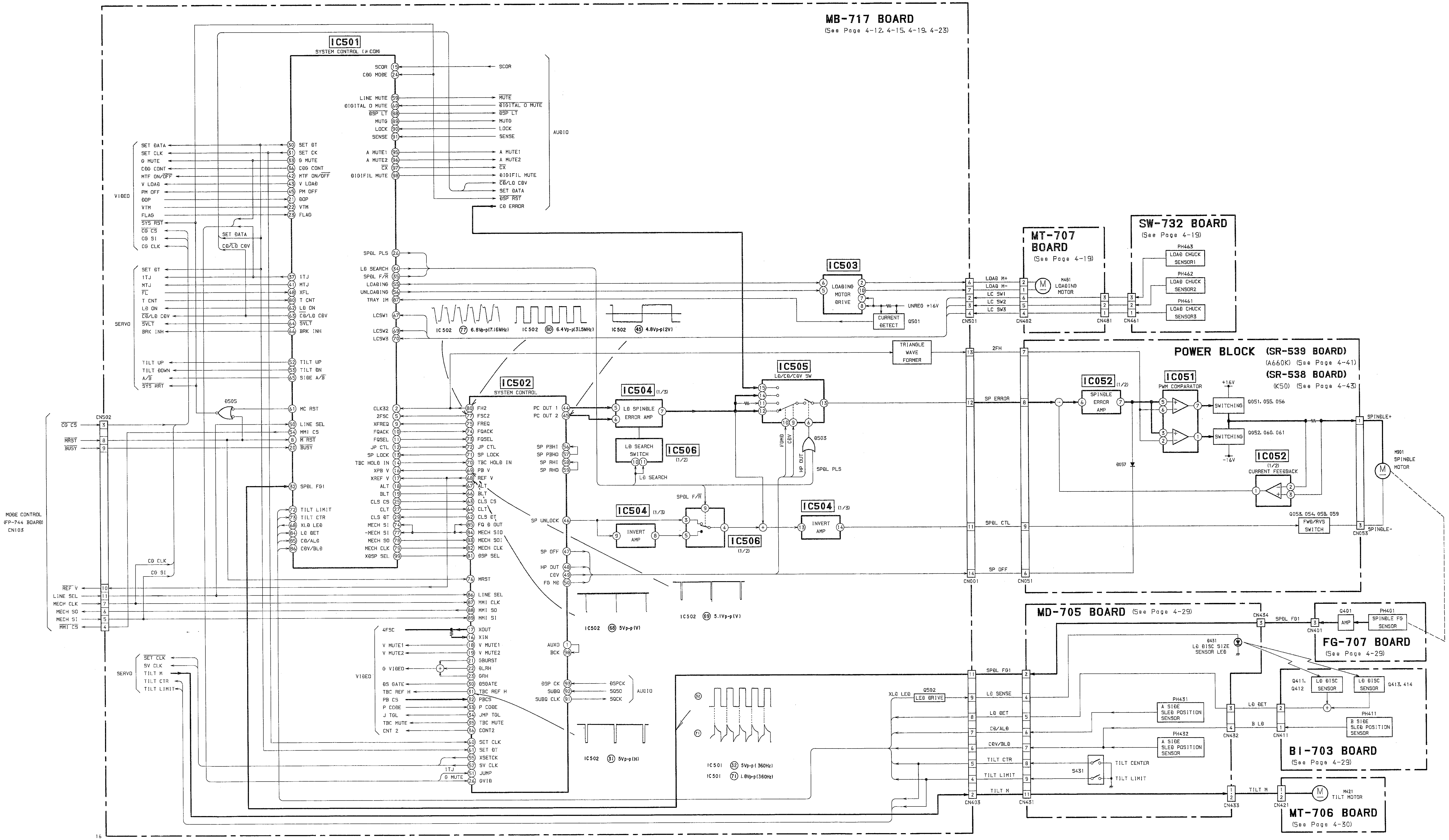
MB-717 BOARD
(See Page 4-12, 4-15, 4-19, 4-23)
OPTICAL BLOCK
(KHS-150A)
IC1
IC2
OEIC
LASER DIODE
LD DRIVE
TILT SENSOR
CN401 FOR CHECK
TRK OPEN
RF
EFM
SLED-
SLED OUT
CN1
CN402
Q405 BUFFER
Q406, 407 AMP
Q408 AMP
HPF
LPF 1.7MHZ
Q409-411 AMP
Q413 LD EFM MUTE
IC407 (1/3)
RF (V) VIDEO
RF (A) AUDIO
EFM
IC406 (1/2) FOCUS ERROR AMP
IC401 (1/3) FOCUS SERVO
CD PHASE COMPENSATION ELEMENT
LD PHASE COMPENSATION ELEMENT
IC403 (1/2) FOCUS COIL DRIVE
Q403, 404 FOCUS COIL DRIVE
FOCUS M
FOCUS RTN
Q414
Q415 PROTECT DET
Q416
IC404 (1/2) RF AMP
IC401 (1/3) TRACKING SERVO
IC403 (1/2) TRACKING COIL DRIVE
Q401, 402 TRACKING COIL DRIVE
TRK M
MTJ
TRK OPEN
IC401 (1/3) SLED/TILT SERVO
PHASE COMPENSATION
IC402 (1/2) SLED MOTOR DRIVE
SLED M
IC405
TILT IN AMP
TILT OUT AMP
RV401 A-TILT
RV402 B-TILT
IC407 (1/3)
IC407 (1/3) Q403, 404, Q417, 418 TILT LIMIT CONTROL
IC402 (1/2) TILT MOTOR DRIVE
TILT M
IC406 (1/2) TILT UP/DOWN CONTROL AMP
TILT DOWN
TILT UP
TILT CTR
TILT LIMIT
Q412 TRACKING BRAKE CONTROL
BRK INH
500K CLK
S CLK
S DATA
LATCH
RST
JUMP
FL
TCNT
SV CLK
SET CLK
SET DT
SVLT
SYS RST
ITJ
FOCUS COIL
TRACKING COIL
M502 SLED MOTOR
UNREG GND
SET DT
ITJ
MTJ
FL
TCNT
LD ON
CD/LD CDV
SVLT
BRK INH
TILT UP
TILT DOWN
A/D
SYS RST
SYSTEM CONTROL (IC501)
SV CLK
SET CLK
SYSTEM CONTROL (IC502)
TILT M
TILT CTR
TILT LIMIT
SYSTEM CONTROL (CN403)

3-4. KARAOKE BLOCK DIAGRAM

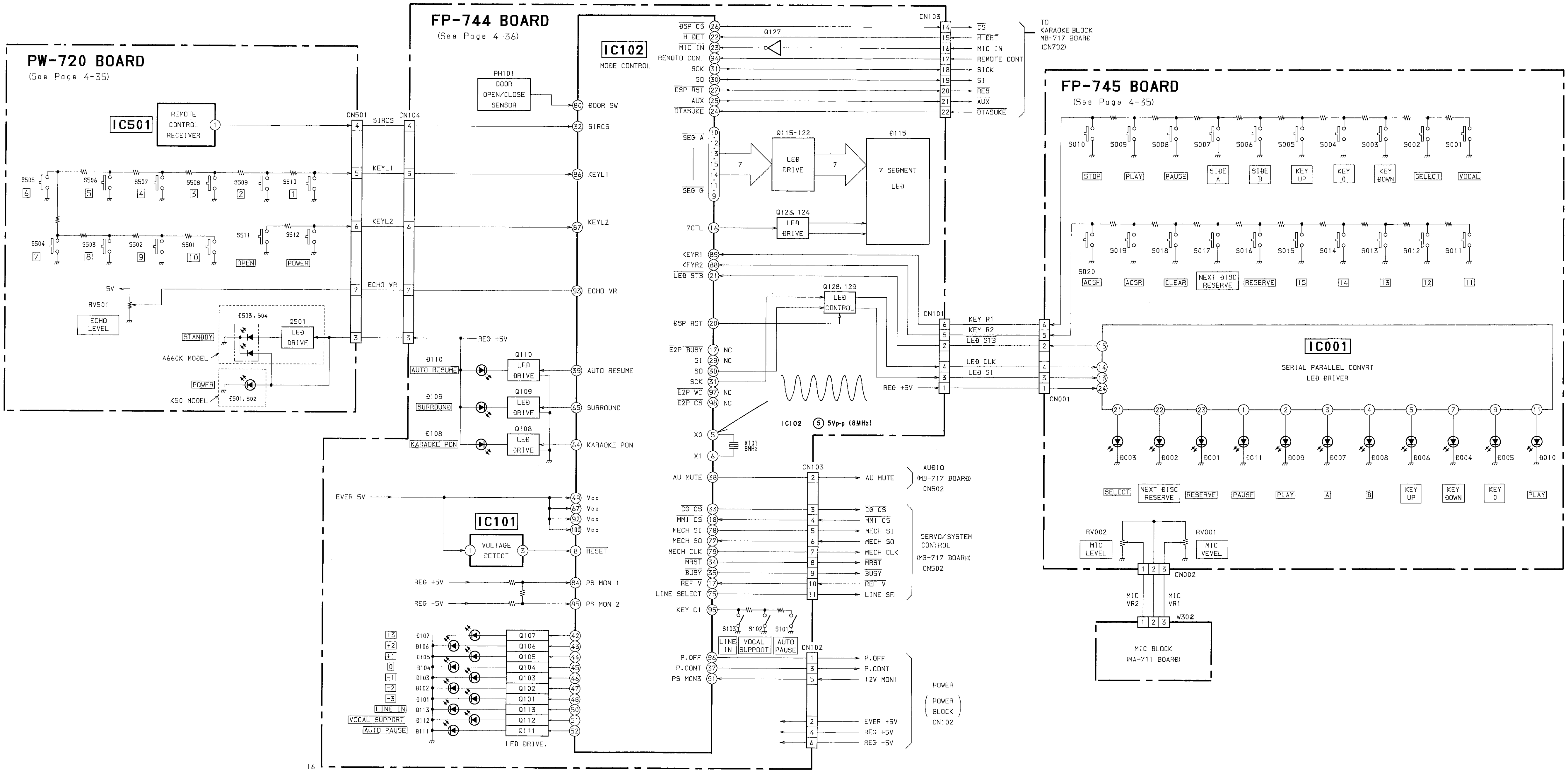


MB-717 BOARD
(See Page 4-12, 4-15, 4-19, 4-23)
KARAOKE
AX-705 BOARD
(See Page 4-24)
LINE IN
VIDEO
AUDIO
L
R
J701
Q701 MUTE
CN701
IC702
IC705 AMP
IC706 AMP
IC707 AMP
IC703 KARAOKE DSP
IC704 D RAM
AIL
AIR
AIM
AUDIO (IC203)
AFM L CH
AFM R CH
MA-711 BOARD (See Page 4-25)
MIC 1
MIC 2
MIC 1/2 CONTROL
J502
J301
Q301 INV
IC301 AMP
IC302 DC CONTROL AMP
IC303
IC304 MIX AMP
IC305 MIC DET
CN301
CN702
MIC IN
MIC SIG IN
W302
TO MODE CONTROL FP-745 BOARD CN002
Q703 BUFFER
Q702 FL AMP
Q704 INV AMP
EXT VIDEO
VIDEO
MIC IN
TO AUDIO
AUDIO (IC201, 205)
CN502
REMOTE CONT
DTAKE
H DET
AUX
MIC IN
RES
CS
SI
SI CK
TO MODE CONTROL FP-744 BOARD CN103

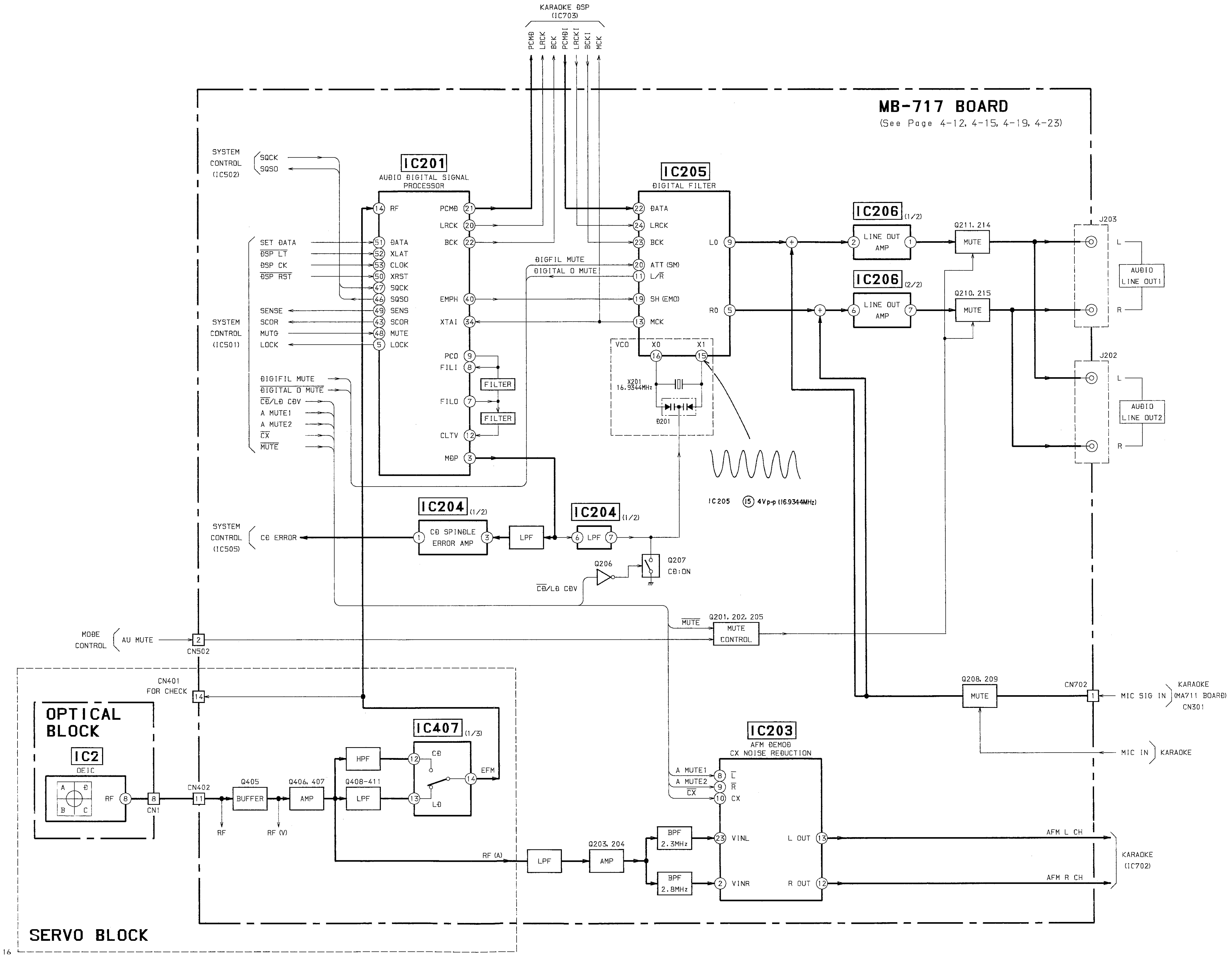
3-5. SYSTEM CONTROL BLOCK DIAGRAM


MB-717 BOARD
(See Page 4-12, 4-15, 4-19, 4-23)
IC501
SYSTEM CONTROL (μ COM)
IC502
SYSTEM CONTROL
IC503
LOADING MOTOR DRIVE
CURRENT DETECT
Q501
UNREG +16V
IC504 (1/3)
LD SPINDLE ERROR AMP
LD SEARCH SWITCH
IC506 (1/2)
IC505
LD/CD/CDV SW
Q503
TRIANGLE WAVE FORMER
IC504 (1/3)
INVERT AMP
IC506 (1/2)
IC504 (1/3)
INVERT AMP
AUDIO
VIDEO
SERVO
MODE CONTROL (FP-744 BOARD) CN103
CN502
Q505
IC502 (77) 6.8Vp-p(7.16MHz)
IC502 (80) 6.4Vp-p(31.5MHz)
IC502 (45) 4.8Vp-p(2V)
IC502 (68) 5Vp-p(V)
IC502 (69) 5.1Vp-p(V)
IC502 (31) 5Vp-p(H)
IC501 (32) 5Vp-p(360Hz)
IC501 (71) 1.8Vp-p(360Hz)
MT-707 BOARD
(See Page 4-19)
M481 LOADING MOTOR
SW-732 BOARD
(See Page 4-19)
PH463 LOAD CHUCK SENSOR1
PH462 LOAD CHUCK SENSOR2
PH461 LOAD CHUCK SENSOR3
LOAD M+
LOAD M-
LC SW1
LC SW2
LC SW3
CN501
CN482
CN481
CN461
POWER BLOCK (SR-539 BOARD)
(A660K) (See Page 4-41)
(SR-538 BOARD)
(K50) (See Page 4-43)
IC052 (1/2)
SPINDLE ERROR AMP
IC051
PWM COMPARATOR
SWITCHING
Q051, 055, 056
Q052, 060, 061
IC052 (1/2)
CURRENT FEEDBACK
Q057
Q053, 054, 058, 059
FWD/RVS SWITCH
+16V
-16V
SPINDLE+
SPINDLE-
M901 SPINDLE MOTOR
2FH
SP ERROR
SP CTL
SP OFF
CN001
CN051
CN053
MD-705 BOARD (See Page 4-29)
Q431 LD DISC SIZE SENSOR LED
Q592 LED DRIVE
XLD LED
LD SENSE
LD DET
CD/ALD
CDV/BLD
TILT CTR
TILT LIMIT
TILT M
SPDL FG1
S431 TILT CENTER TILT LIMIT
PH431 A SIDE SLED POSITION SENSOR
PH432 A SIDE SLED POSITION SENSOR
CN403
CN431
CN432
CN433
CN434
FG-707 BOARD
(See Page 4-29)
Q401 AMP
PH401 SPINDLE FG SENSOR
CN401
BI-703 BOARD
(See Page 4-29)
Q411, Q412 LD DISC SENSOR
LD DISC SENSOR Q413, 414
PH411 B SIDE SLED POSITION SENSOR
CN411
MT-706 BOARD
(See Page 4-30)
M421 TILT MOTOR
CN421

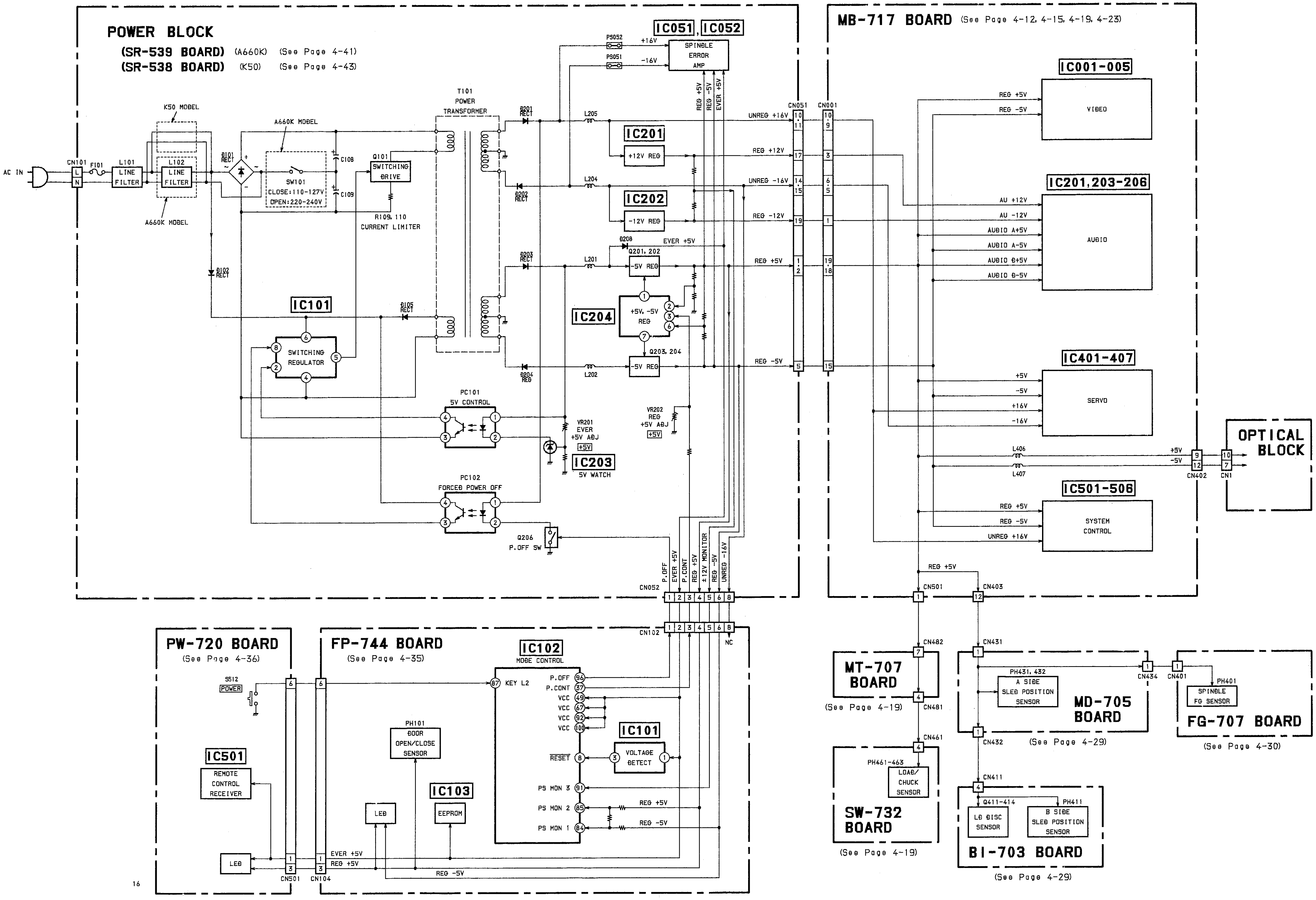
3-6. MODE CONTROL BLOCK DIAGRAM


PW-720 BOARD
(See Page 4-35)
IC501
REMOTE CONTROL RECEIVER
S505 S506 S507 S508 S509 S510
S504 S503 S502 S501 S511 S512
OPEN
POWER
5V
RV501
ECHO LEVEL
STANDBY
A660K MODEL
POWER
K50 MODEL
D503, 504
D501, 502
Q501
LED DRIVE
CN501
CN104
SIRCS
KEYL1
KEYL2
ECHO VR
REG +5V
FP-744 BOARD
(See Page 4-36)
PH101
DOOR OPEN/CLOSE SENSOR
IC102
MODE CONTROL
DOOR SW
SIRCS
KEYL1
KEYL2
ECHO VR
AUTO RESUME
SURROUND
KARAOKE PON
D110
D109
D108
Q110
Q109
Q108
LED DRIVE
EVER 5V
Vcc
IC101
VOLTAGE DETECT
RESET
REG +5V
REG -5V
PS MON 1
PS MON 2
D107 D106 D105 D104 D103 D102 D101 D113 D112 D111
Q107 Q106 Q105 Q104 Q103 Q102 Q101 Q113 Q112 Q111
LINE IN
VOCAL SUPPORT
AUTO PAUSE
LED DRIVE.
DSP CS
H DET
MIC IN
REMOTO CONT
SCK
SO
DSP RST
AUX
OTASUKE
Q127
CN103
CS
H DET
MIC IN
REMOTE CONT
SICK
SI
RES
AUX
OTASUKE
TO KARAOKE BLOCK MB-717 BOARD (CN702)
SEG A
SEG G
Q115-122
LED DRIVE
D115
7 SEGMENT LED
7CTL
Q123, 124
LED DRIVE
KEYR1
KEYR2
LED STB
Q128, 129
LED CONTROL
DSP RST
E2P BUSY
SI
SO
SCK
E2P WC
E2P CS
NC
X0
X1
X101 8MHz
IC102 ⑤ 5Vp-p (8MHz)
CN101
KEY R1
KEY R2
LED STB
LED CLK
LED SI
REG +5V
AU MUTE
AUDIO (MB-717 BOARD) CN502
CG CS
MMI CS
MECH SI
MECH SO
MECH CLK
MRST
BUSY
REF V
LINE SELECT
LINE SEL
SERVO/SYSTEM CONTROL (MB-717 BOARD) CN502
KEY C1
S103 S102 S101
LINE IN
VOCAL SUPPOOT
AUTO PAUSE
CN102
P.OFF
P.CONT
PS MON3
12V MONI
EVER +5V
REG +5V
REG -5V
POWER (POWER BLOCK CN102)
FP-745 BOARD
(See Page 4-35)
S010 S009 S008 S007 S006 S005 S004 S003 S002 S001
STOP
PLAY
PAUSE
SIDE A
SIDE B
KEY UP
KEY 0
KEY DOWN
SELECT
VOCAL
S019 S018 S017 S016 S015 S014 S013 S012 S011
S020
ACSF
ACSR
CLEAR
NEXT DISC RESERVE
RESERVE
15 14 13 12 11
CN001
IC001
SERIAL PARALLEL CONVRT LED DRIVER
D003 D002 D001 D011 D009 D007 D008 D006 D004 D005 D010
SELECT
NEXT DISC RESERVE
RESERVE
PAUSE
PLAY
A
B
KEY UP
KEY DOWN
KEY 0
PLAY
RV002
MIC LEVEL
RV001
MIC VEVEL
CN002
MIC VR2
MIC VR1
W302
MIC BLOCK (MA-711 BOARD)

3-7. AUDIO BLOCK DIAGRAM

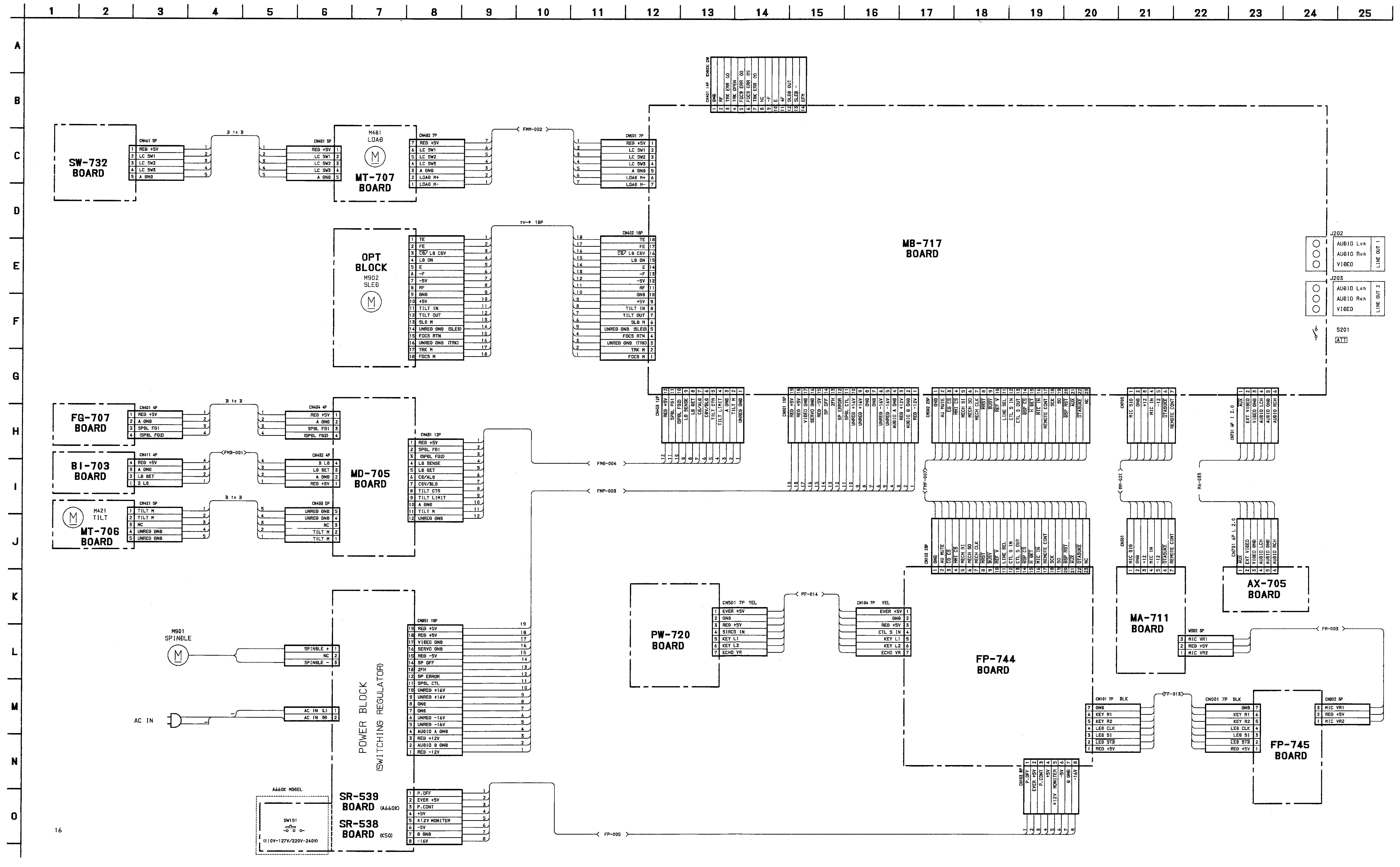

KARAOKE DSP (IC703)
PCMD LRCK BCK PCMDI LRCKI BCKI MCK
MB-717 BOARD
(See Page 4-12, 4-15, 4-19, 4-23)
SYSTEM CONTROL (IC502)
SQCK
SQSO
IC201
AUDIO DIGITAL SIGNAL PROCESSOR
RF
PCMD
LRCK
BCK
SET DATA
DSP LT
DSP CK
DSP RST
DATA
XLAT
CLOK
XRST
SQCK
SQSO
SENSE
SCOR
MUTG
LOCK
SENS
SCOR
MUTE
LOCK
SYSTEM CONTROL (IC501)
EMPH
XTAI
PCO
FILI
FILO
CLTV
MDP
FILTER
FILTER
DIGIFIL MUTE
DIGITAL 0 MUTE
CD/LD CDV
A MUTE1
A MUTE2
CX
MUTE
IC205
DIGITAL FILTER
DATA
LRCK
BCK
ATT (SM)
L/R
SH (EMD)
MCK
LO
RO
VCO
XO
XI
X201 16.9344MHz
D201
IC205 ⑮ 4Vp-p (16.9344MHz)
IC206 (1/2)
LINE OUT AMP
IC206 (2/2)
LINE OUT AMP
Q211, 214
MUTE
Q210, 215
MUTE
J203
L
R
AUDIO LINE OUT1
J202
L
R
AUDIO LINE OUT2
SYSTEM CONTROL (IC505)
CD ERROR
IC204 (1/2)
CD SPINDLE ERROR AMP
LPF
IC204 (1/2)
LPF
Q206
Q207
CD:ON
CD/LD CDV
MUTE
Q201, 202, 205
MUTE CONTROL
MODE CONTROL
AU MUTE
CN502
CN401 FOR CHECK
Q208, 209
MUTE
CN702
MIC SIG IN
KARAOKE (MA711 BOARD) CN301
MIC IN
KARAOKE
OPTICAL BLOCK
IC2
OEIC
A B C D
RF
CN1
CN402
Q405
BUFFER
Q406, 407
AMP
Q408-411
HPF
LPF
IC407 (1/3)
CD
LD
EFM
RF
RF (V)
RF (A)
LPF
Q203, 204
AMP
BPF 2.3MHz
BPF 2.8MHz
IC203
AFM DEMOD CX NOISE REDUCTION
A MUTE1
A MUTE2
CX
L
R
CX
VINL
VINR
L OUT
R OUT
AFM L CH
AFM R CH
KARAOKE (IC702)
SERVO BLOCK
16

3-8. POWER BLOCK DIAGRAM


POWER BLOCK
(SR-539 BOARD) (A660K) (See Page 4-41)
(SR-538 BOARD) (K50) (See Page 4-43)
AC IN
CN101
F101
L101 LINE FILTER
K50 MODEL
L102 LINE FILTER
A660K MODEL
D101 RECT
SW101 CLOSE:110-127V OPEN:220-240V
C108
C109
Q101 SWITCHING DRIVE
R109, 110 CURRENT LIMITER
T101 POWER TRANSFORMER
D102 RECT
IC101
D105 RECT
SWITCHING REGULATOR
PC101 5V CONTROL
PC102 FORCED POWER OFF
Q206 P.OFF SW
VR201 EVER +5V ADJ
+5V
IC203
5V WATCH
VR202 REG +5V ADJ
+5V
D201 RECT
D202 RECT
D203 RECT
D204 REC
L205
L204
L201
L202
PS052
PS051
+16V
-16V
IC051, IC052
SPINDLE ERROR AMP
REG +5V
REG -5V
EVER +5V
IC201
+12V REG
IC202
-12V REG
D208
EVER +5V
Q201, 202
-5V REG
IC204
+5V, -5V REG
Q203, 204
-5V REG
UNREG +16V
REG +12V
UNREG -16V
REG -12V
REG +5V
REG -5V
CN051
CN001
P.OFF
EVER +5V
P.CONT
REG +5V
±12V MONITOR
REG -5V
UNREG -16V
CN052
CN102
NC
MB-717 BOARD (See Page 4-12, 4-15, 4-19, 4-23)
IC001-005
REG +5V
REG -5V
VIDEO
IC201,203-206
AU +12V
AU -12V
AUDIO A+5V
AUDIO A-5V
AUDIO D+5V
AUDIO D-5V
AUDIO
IC401-407
+5V
-5V
+16V
-16V
SERVO
L406
L407
+5V
-5V
CN402
CN1
OPTICAL BLOCK
IC501-506
REG +5V
REG -5V
UNREG +16V
SYSTEM CONTROL
REG +5V
CN501
CN403
PW-720 BOARD
(See Page 4-36)
S512 POWER
IC501
REMOTE CONTROL RECEIVER
LED
CN501
FP-744 BOARD
(See Page 4-35)
IC102
MODE CONTROL
KEY L2
P.OFF
P.CONT
VCC
RESET
PS MON 3
PS MON 2
PS MON 1
IC101
VOLTAGE DETECT
PH101 DOOR OPEN/CLOSE SENSOR
IC103
EEPROM
LED
EVER +5V
REG +5V
REG -5V
CN104
CN482
MT-707 BOARD
(See Page 4-19)
CN481
CN461
PH461-463 LOAD/CHUCK SENSOR
SW-732 BOARD
(See Page 4-19)
CN431
PH431, 432 A SIDE SLED POSITION SENSOR
MD-705 BOARD
CN432
(See Page 4-29)
CN434
CN401
PH401 SPINDLE FG SENSOR
FG-707 BOARD
(See Page 4-30)
CN411
Q411-414
LD DISC SENSOR
PH411
B SIDE SLED POSITION SENSOR
BI-703 BOARD
(See Page 4-29)
16

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


SW-732 BOARD
MT-707 BOARD
MB-717 BOARD
OPT BLOCK
FG-707 BOARD
BI-703 BOARD
MT-706 BOARD
MD-705 BOARD
PW-720 BOARD
FP-744 BOARD
MA-711 BOARD
AX-705 BOARD
FP-745 BOARD
POWER BLOCK (SWITCHING REGULATOR)
SR-539 BOARD
SR-538 BOARD
AC IN
SPINDLE

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○— : indicated a lead wire mounted on the component side.
- ○ : Through hole is omitted.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.*

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- Circled numbers refer to waveforms.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in µF unless otherwise noted. pF: µµF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊏W∿⊐ : fusible resistor.
- ☐ : panel designation.
- ☐ : adjustment for repeair. *
- ━━ : B+ Line. *
- ━ ━ ━ : B– Line. *
- ⇨ : IN/OUT direction of (+, –) B LINE. *
- Circled numbers refer to waveforms.
- Voltages are dc between ground and measurement points. *
- Readings are taken under pause mode.
  (NTSC REF DISC HLV-8 SIDE 1 FRAME No. 4100)
- Readings are taken with a digital multimeter (DC10MΩ). *
- Voltage variations may be noted due to normal production tolerances. *

Note:	**Note:**
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

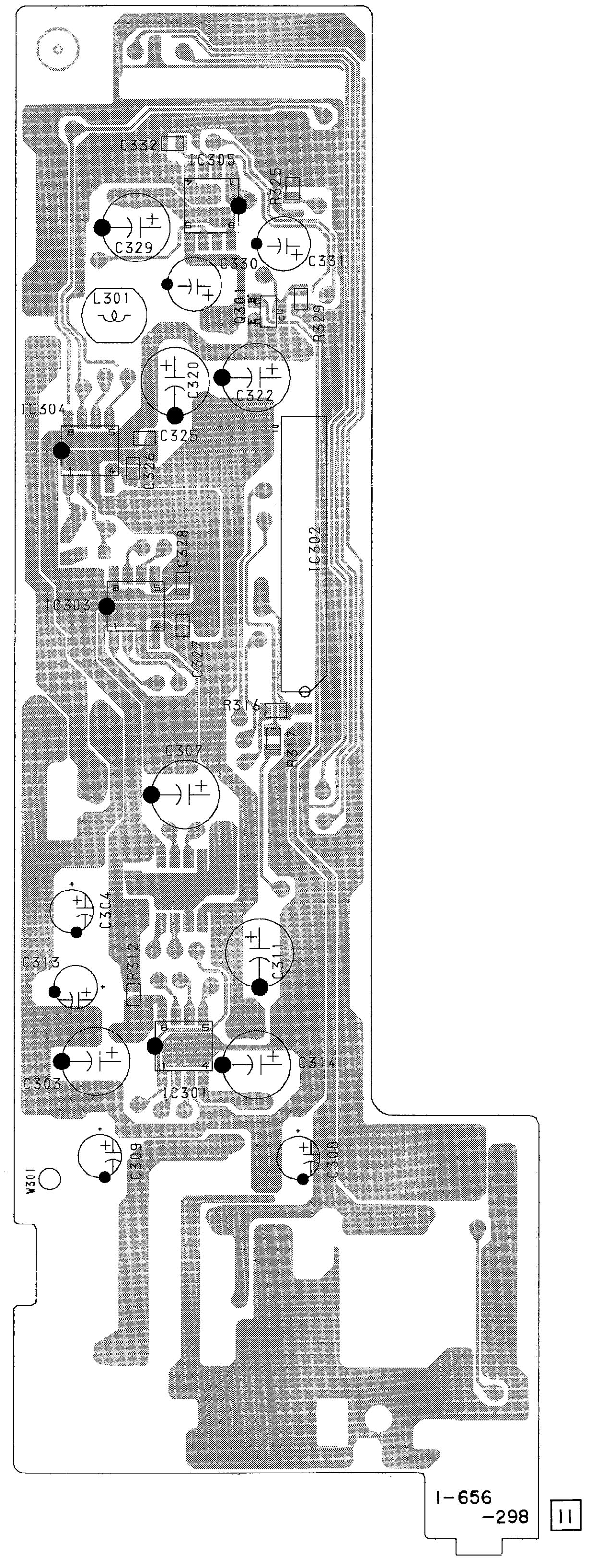
When indicating parts by reference number, please include the board name.

*: indicated by the color red.

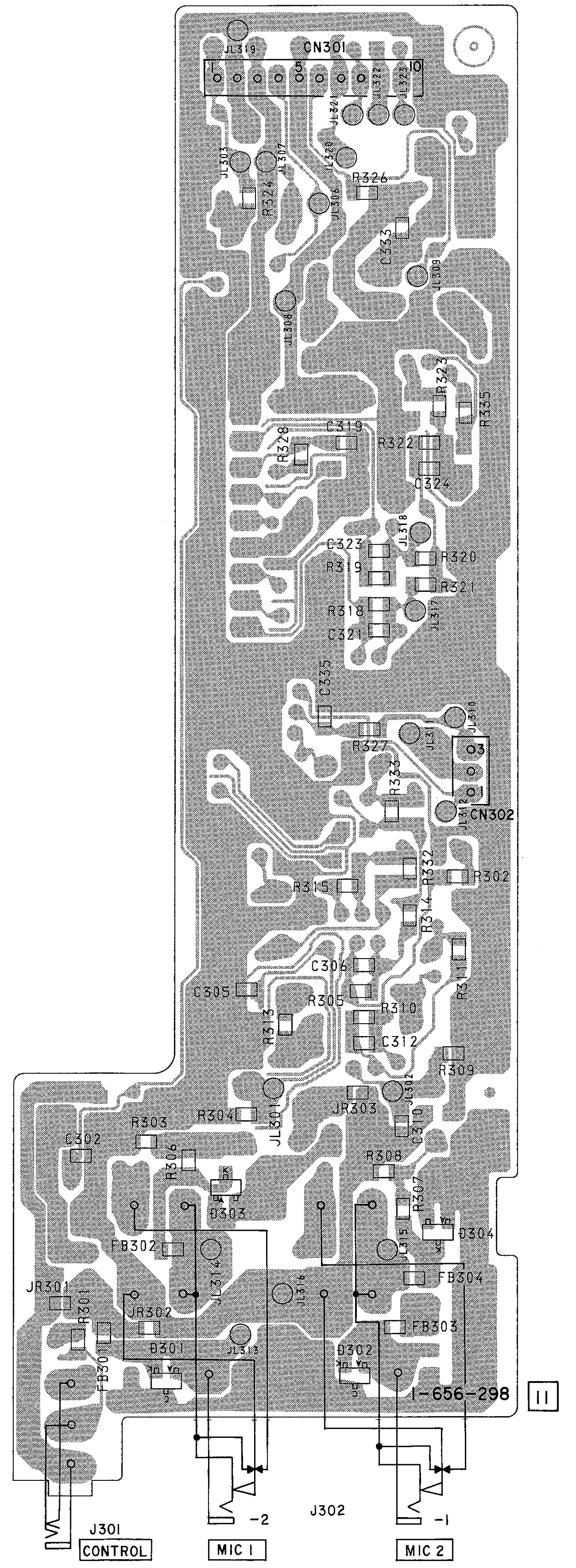
MA-711 (MIC) , AX-705(AUX IN) PRINTED WIRING BOARD

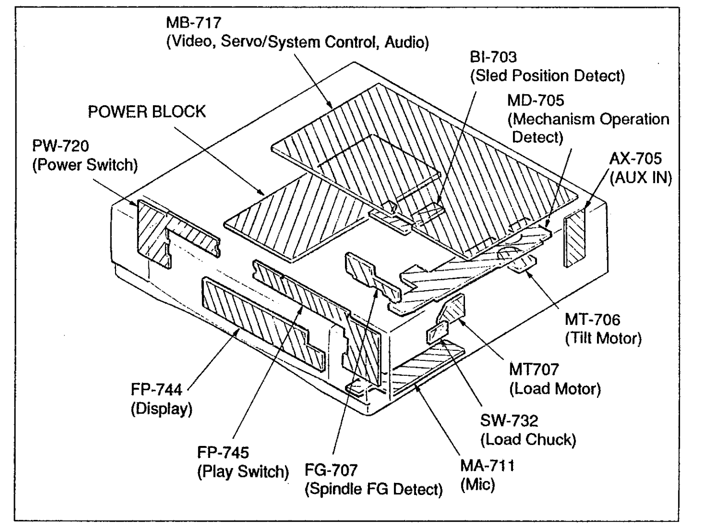
—Ref. No. MA-711 and AX-705 Boards; 3,000 Series—

MA-711 BOARD (COMPONENT SIDE)

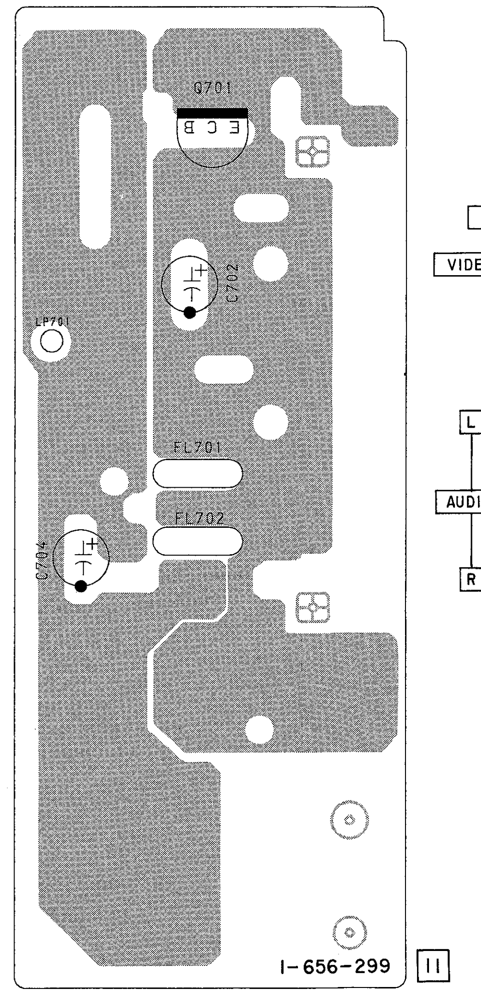


MA-711 BOARD (CONDUCTOR SIDE)

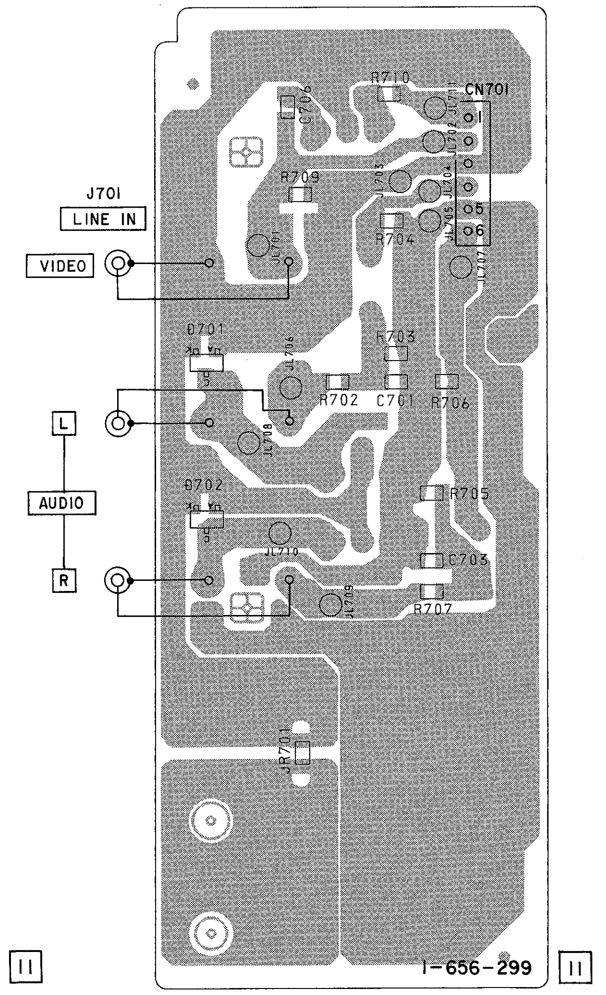

1-656-298 11
J301
CONTROL
MIC 1
J302
MIC 2


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
MD-705
(Mechanism Operation Detect)
POWER BLOCK
PW-720
(Power Switch)
AX-705
(AUX IN)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-744
(Display)
SW-732
(Load Chuck)
FP-745
(Play Switch)
FG-707
(Spindle FG Detect)
MA-711
(Mic)

AX-705 BOARD (COMPONENT SIDE)



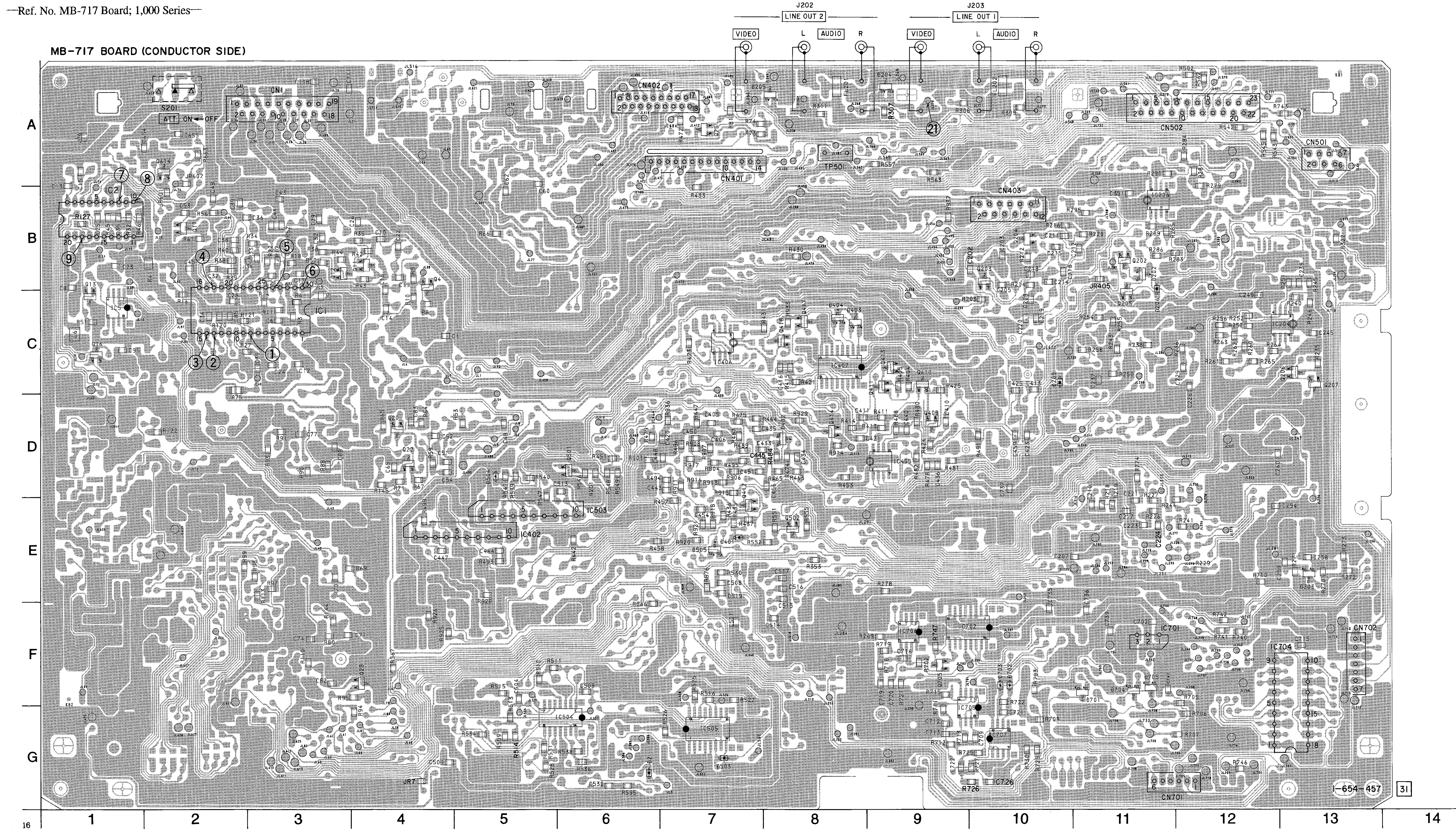
AX-705 BOARD (CONDUCTOR SIDE)


J701
LINE IN
VIDEO
L
AUDIO
R
1-656-299 11

MB-717 (VIDEO, SERVO, SYSTEM CONTROL, AUDIO) PRINTED WIRING BOARD

—Ref. No. MB-717 Board; 1,000 Series—

MB-717 BOARD (CONDUCTOR SIDE)


J202
LINE OUT 2
VIDEO
L
AUDIO
R
J203
LINE OUT 1
VIDEO
L
AUDIO
R
S201
ATT ON ← OFF
CN1
CN402
CN502
CN501
CN403
CN701
A
B
C
D
E
F
G
1-654-457
31
1
2
3
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5
6
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9
10
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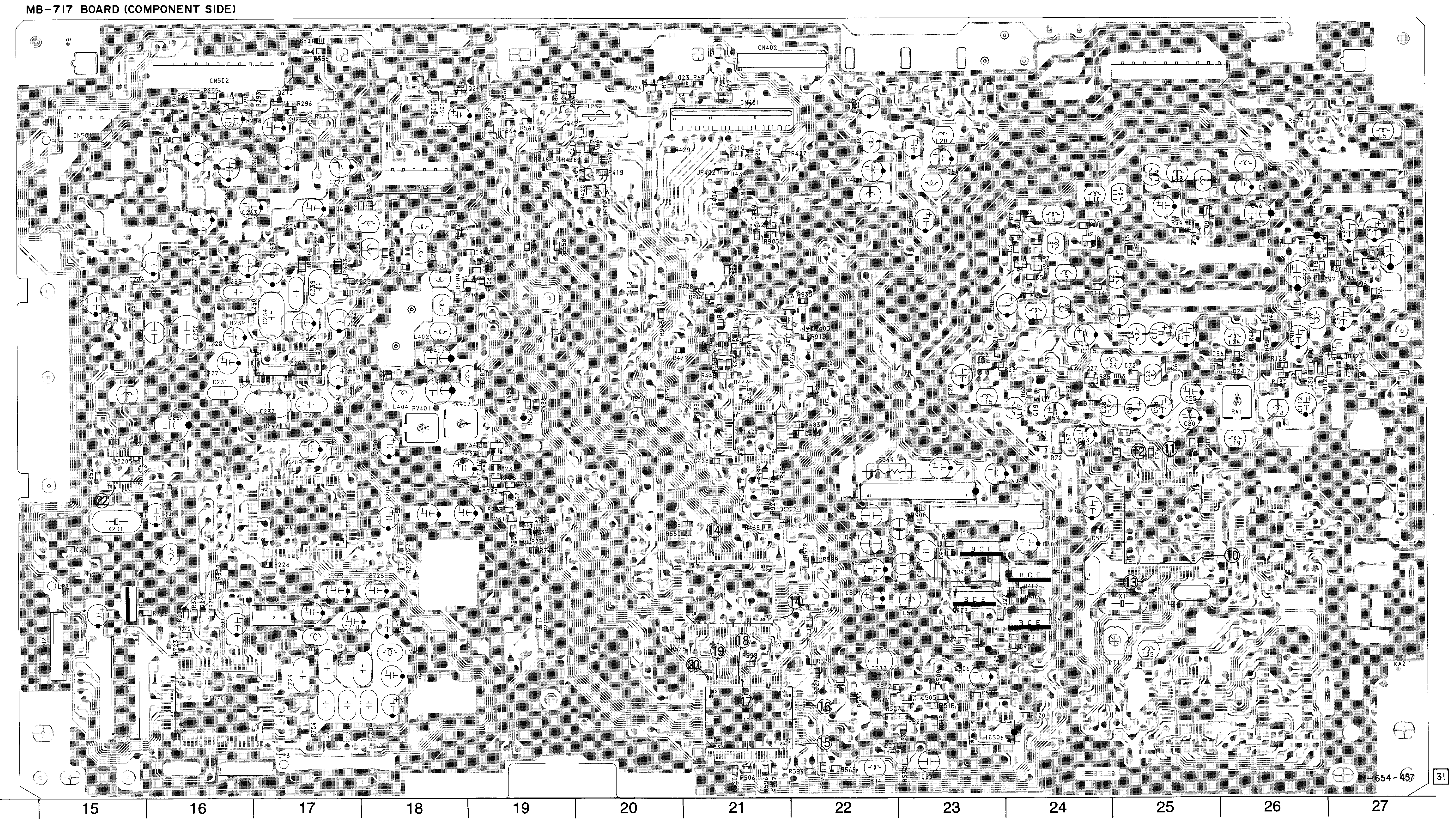
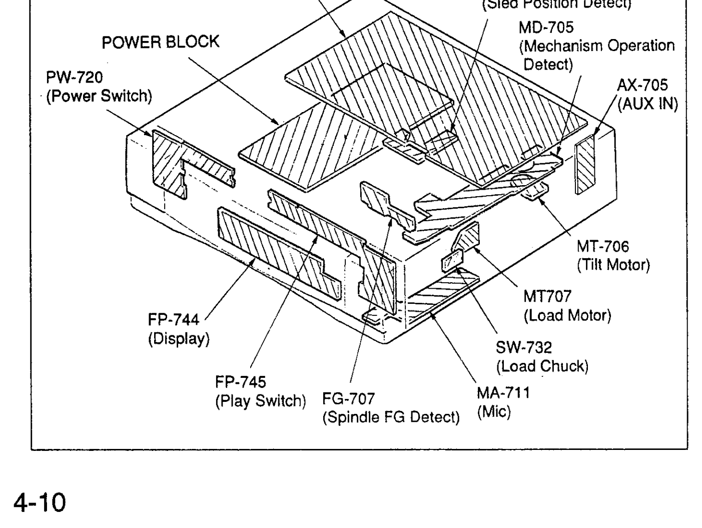
13
14

MB-717 BOARD (COMPONENT SIDE)


1-654-457
31
15
16
17
18
19
20
21
22
23
24
25
26
27

MB-717 BOARD

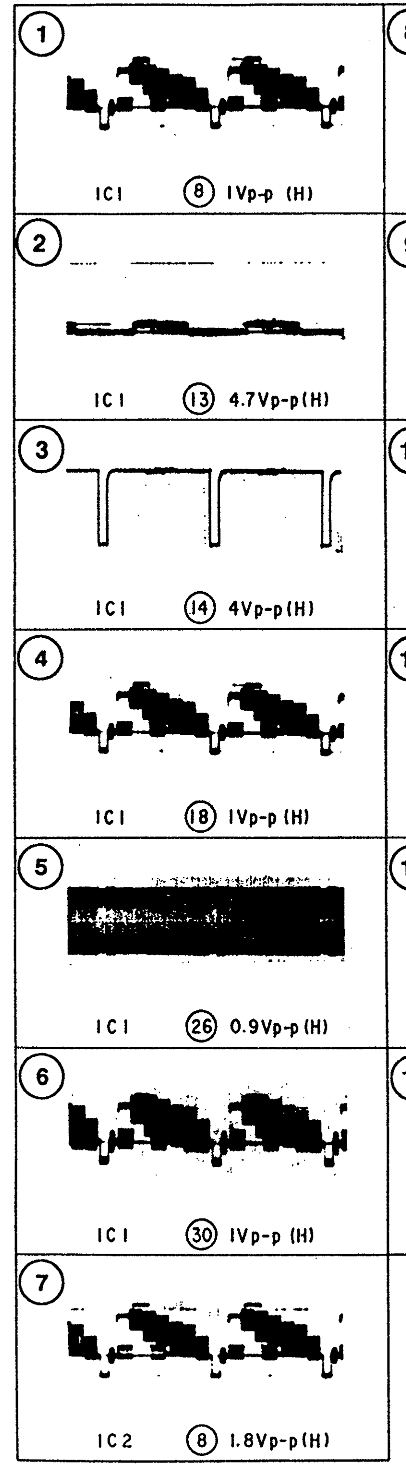
CN001	A-25
CN401	A-21
CN402	A-21
CN403	B-18
CN501	A-15
CN502	A-16
CN701	G-16
CN702	F-15
CT001	F-24
D001	B-24
D002	G-6
D110	C-26
D202	B-11
D203	E-13
D204	A-9
D205	A-8
D206	C-11
D209	C-10
D401	E-7
D402	D-8
D403	C-8
D404	C-8
D405	C-22
D501	G-22
D503	G-7
D504	D-5
D505	E-7
D701	F-11
D702	F-11
D702	F-10
D703	F-10
D704	F-11
D705	F-11
D706	D-19
IC001	C-3
IC002	B-1
IC003	E-25
IC004	B-26
IC005	C-1
IC201	E-17
IC203	C-17
IC204	C-13
IC205	D-15
IC206	B-11
IC401	D-21
IC402	E-24
IC403	F-23
IC404	B-21
IC405	D-9
IC406	C-7
IC407	C-8
IC501	F-21
IC502	G-21
IC503	E-22
IC504	G-6
IC505	G-7
IC506	G-23
IC701	F-17
IC702	F-9
IC703	G-16
IC704	G-15
IC705	G-9
IC706	F-9
IC707	G-10
Q001	B-24
Q002	C-24
Q003	C-24
Q004	B-4
Q007	C-23
Q009	B-25
Q011	B-4
Q012	B-3
Q013	C-1
Q014	B-25
Q015	B-27
Q016	C-1
Q017	B-2
Q019	D-24
Q020	D-4
Q021	D-24
Q022	D-4
Q023	A-20
Q024	C-26
Q025	A-7
Q026	A-20
Q027	D-24
Q028	F-4
Q030	D-26
Q201	B-17
Q202	B-11
Q203	B-10
Q204	B-10
Q205	C-11
Q206	C-13
Q207	C-13
Q208	A-16
Q209	B-16
Q210	A-18
Q211	A-18
Q214	A-16
Q215	A-17
Q401	E-24
Q402	F-24
Q403	F-23
Q404	E-23
Q405	A-20
Q406	B-20
Q407	B-20
Q408	C-19
Q409	D-9
Q410	C-9
Q411	C-9
Q412	E-7
Q413	C-9
Q414	D-8
Q415	C-21
Q416	C-21
Q417	C-8
Q418	C-8
Q501	D-6
Q502	E-8
Q614	A-2
Q702	E-19
Q703	E-19
Q704	D-19
Q705	F-9
RV001	D-26
RV401	D-18
RV402	D-18

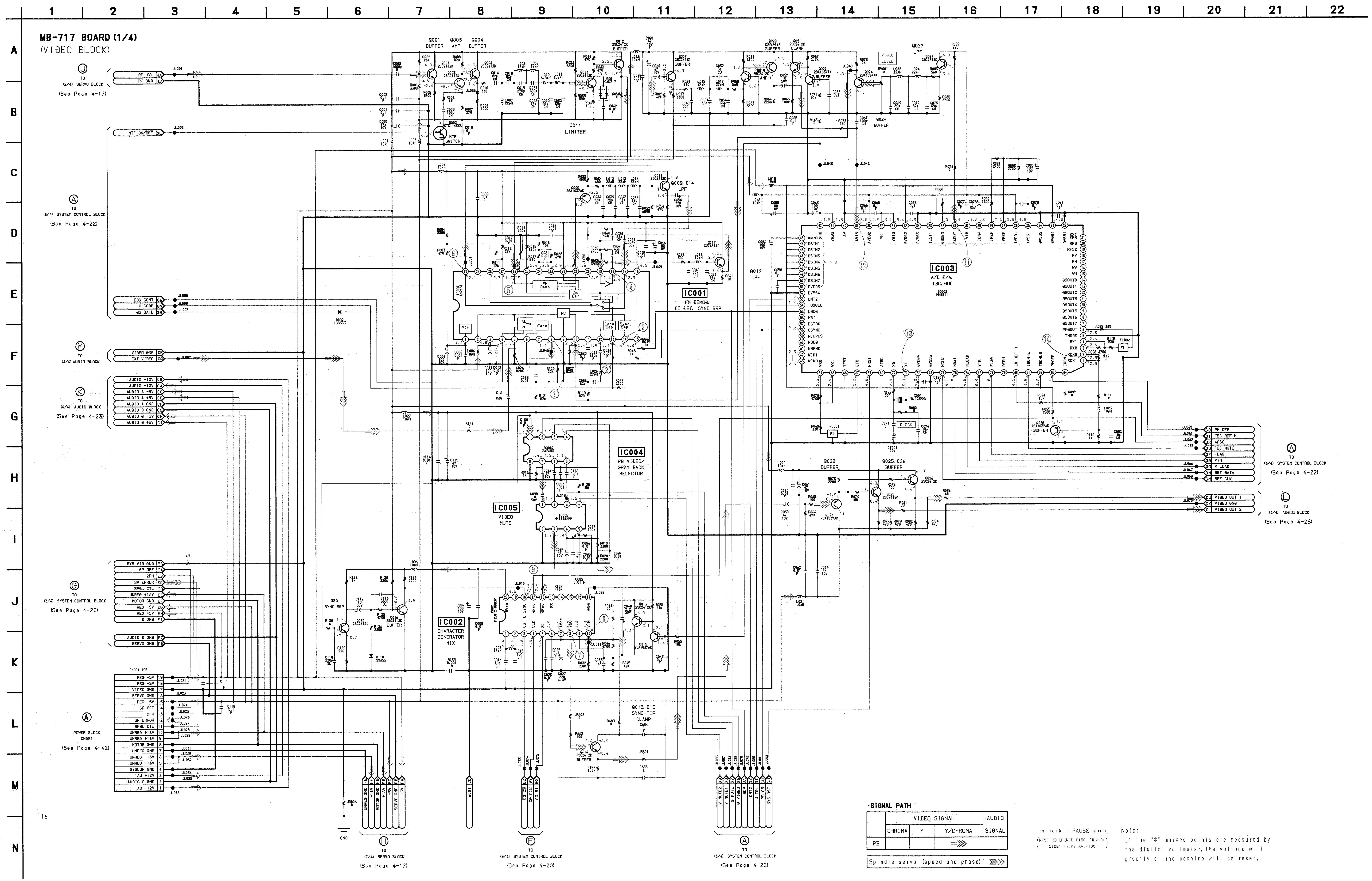

MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
MD-705
(Mechanism Operation Detect)
POWER BLOCK
PW-720
(Power Switch)
AX-705
(AUX IN)
MT-706
(Tilt Motor)
MT707
(Load Motor)
SW-732
(Load Chuck)
FP-744
(Display)
FP-745
(Play Switch)
FG-707
(Spindle FG Detect)
MA-711
(Mic)

MB-717 (VIDEO) SCHEMATIC DIAGRAM

—Ref. No. MB-717 Board; 1,000 Series—

MB-717 BOARD (1/4)
no mark : PAUSE mode.
(NTSC REFERENCE DISC (HLV-8I) SIDEI Frame No.4100)





1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
A B C D E F G H I J K L M N
MB-717 BOARD (1/4)
(VIDEO BLOCK)
Ⓙ TO (2/4) SERVO BLOCK (See Page 4-17)
RF (V)
RF GND
MTF ON/OFF
Ⓐ TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-22)
EDG CONT
P CODE
BS DATE
Ⓜ TO (4/4) AUDIO BLOCK
VIDEO GND
EXT VIDEO
Ⓚ TO (4/4) AUDIO BLOCK (See Page 4-23)
Ⓖ TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-20)
Ⓐ POWER BLOCK CN051 (See Page 4-42)
CN001 19P
Q001 BUFFER
Q003 AMP
Q004 BUFFER
Q002 MTF SWITCH
Q011 LIMITER
Q009, 014 LPF
Q017 LPF
Q027 LPF
Q024 BUFFER
VIDEO LEVEL
IC001 FM DEMOD. BO DET, SYNC SEP
IC003 A/D, D/A, TBC, DOC
IC004 PB VIDEO/ GRAY BACK SELECTOR
IC005 VIDEO MUTE
IC002 CHARACTER GENERATOR MIX
Q30 SYNC SEP
Q016 BUFFER
Q013, 015 SYNC-TIP CLAMP
Q014 BUFFER
Q023 BUFFER
Q025, 026 BUFFER
CLOCK
FM OFF
TBC REF H
4FSC
TBC MUTE
FLAG
VTM
V LOAD
SET DATA
SET CLK
Ⓐ TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-22)
VIDEO OUT 1
VIDEO GND
VIDEO OUT 2
Ⓛ TO (4/4) AUDIO BLOCK (See Page 4-26)
Ⓗ TO (2/4) SERVO BLOCK (See Page 4-17)
Ⓕ TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-20)
Ⓐ TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-22)
GND
16

·SIGNAL PATH

	VIDEO SIGNAL			AUDIO
	CHROMA	Y	Y/CHROMA	SIGNAL
PB			⇒	

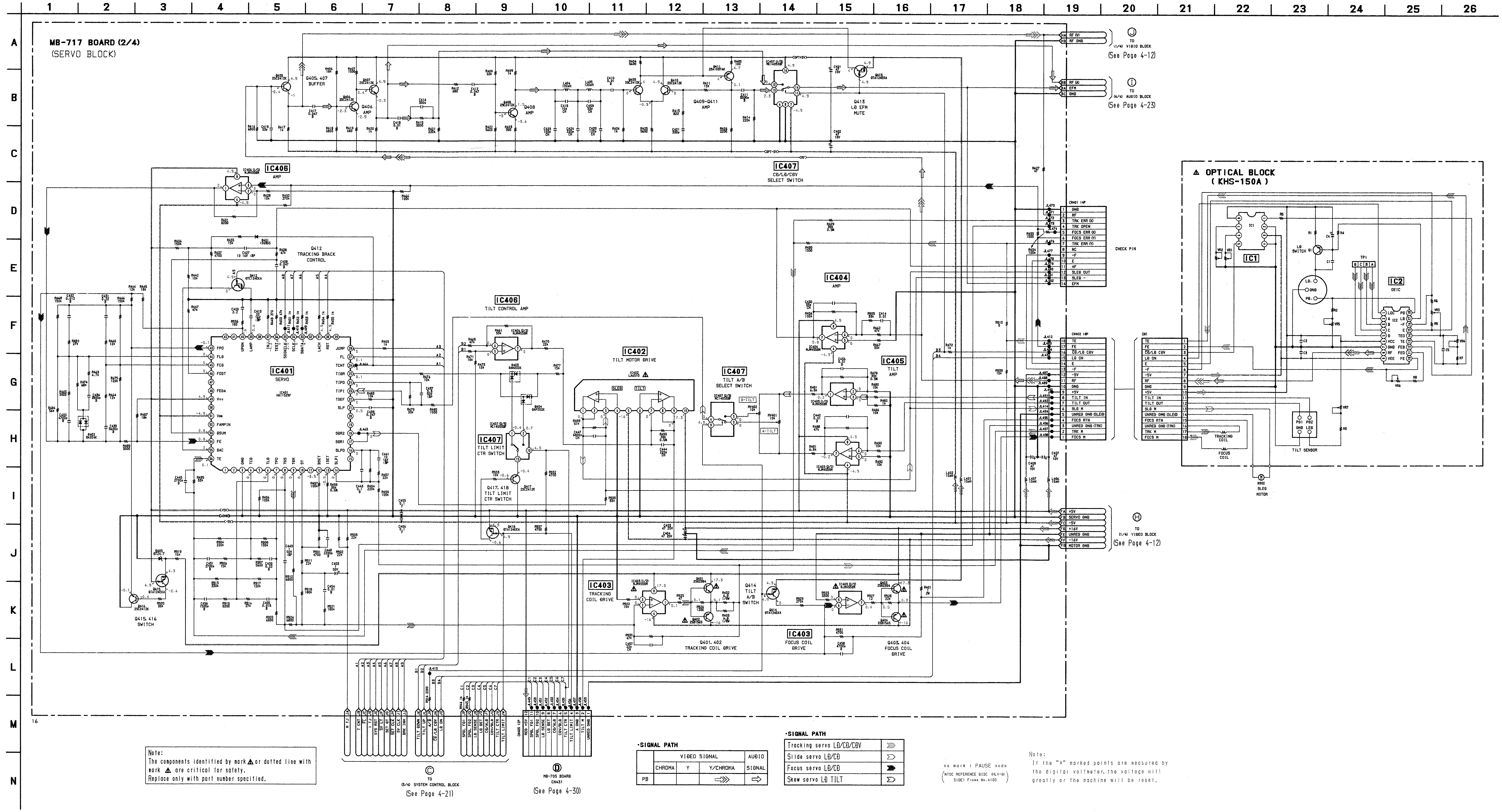
Spindle servo (speed and phase)	⇒

no mark : PAUSE mode
(NTSC REFERENCE DISC (HLV-8) SIDE1 Frame No.4100)

Note:
If the "*" marked points are measured by the digital voltmeter, the voltage will greatly or the machine will be reset.

MB-717 (SERVO) SCHEMATIC DIAGRAM •Refer to page 4-6 for printed wiring board of MB-717 BOARD.

—Ref. No. MB-717 Board; 1,000 Series—


MB-717 BOARD (2/4)
(SERVO BLOCK)
IC406 AMP
IC407 CD/LD/CDV SELECT SWITCH
IC404 AMP
IC405 TILT AMP
IC406 TILT CONTROL AMP
IC402 TILT MOTOR DRIVE
IC407 TILT A/B SELECT SWITCH
IC401 SERVO
IC407 TILT LIMIT CTR SWITCH
Q417, 418 TILT LIMIT CTR SWITCH
Q412 TRACKING BRACK CONTROL
Q405, 407 BUFFER
Q406 AMP
Q408 AMP
Q409-Q411 AMP
Q413 LD EFM MUTE
IC403 TRACKING COIL DRIVE
Q401, 402 TRACKING COIL DRIVE
Q414 TILT A/B SWITCH
IC403 FOCUS COIL DRIVE
Q403, 404 FOCUS COIL DRIVE
Q415, 416 SWITCH
CHECK PIN
ⓙ TO (1/4) VIDEO BLOCK (See Page 4-12)
Ⓘ TO (4/4) AUDIO BLOCK (See Page 4-23)
Ⓗ TO (1/4) VIDEO BLOCK (See Page 4-12)
Ⓒ TO (3/4) SYSTEM CONTROL BLOCK (See Page 4-21)
Ⓓ MB-705 BOARD CN431 (See Page 4-30)
⚠ OPTICAL BLOCK (KHS-150A)
IC1
IC2 OEIC
LD SWITCH
TRACKING COIL
FOCUS COIL
TILT SENSOR
M902 SLED MOTOR

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB			⇒⟫	⇒

•SIGNAL PATH

Tracking servo LD/CD/CDV	⟫
Slide servo LD/CD	▷
Focus servo LD/CD	➤
Skew servo LD TILT	▷

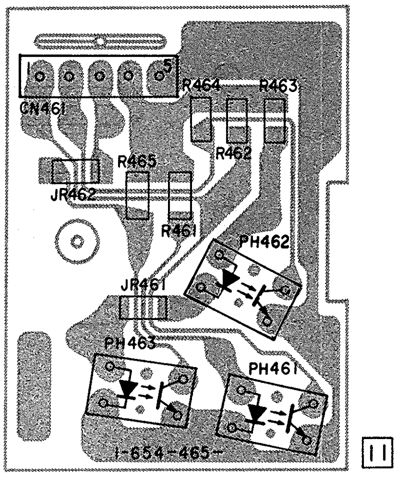
no mark : PAUSE mode
(NTSC REFERENCE DISC (HLV-8) SIDE1 Frame No.4100)

Note:
If the "*" marked points are measured by the digital voltmeter, the voltage will greatly or the machine will be reset.

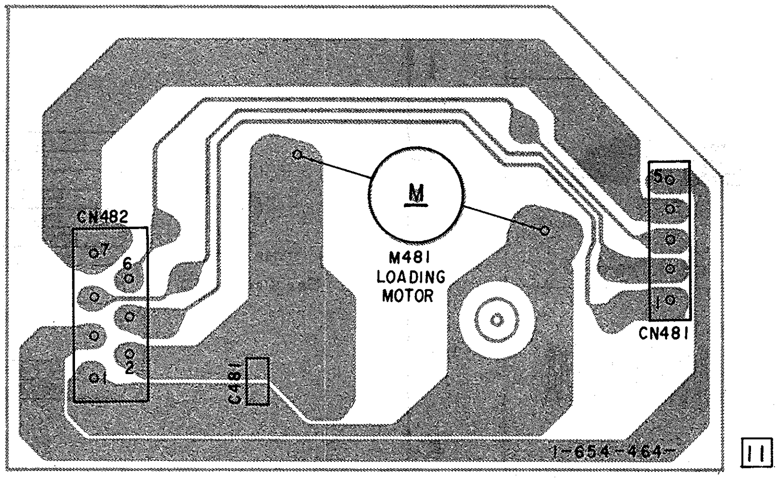
MT-707 (LOADING MOTOR), SW-732 (LOAD CHUCK) PRINTED WIRING BOARDS

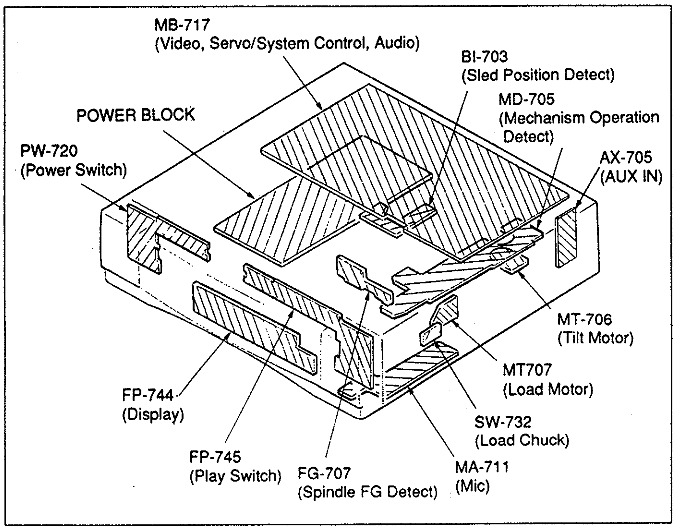
—Ref. No. MT-707 and SW-732 Boards; 4,000 Series—

SW-732 BOARD


CN461
1
5
R464
R463
R462
R465
JR462
R461
PH462
JR461
PH463
PH461
1-654-465-
11

MT-707 BOARD

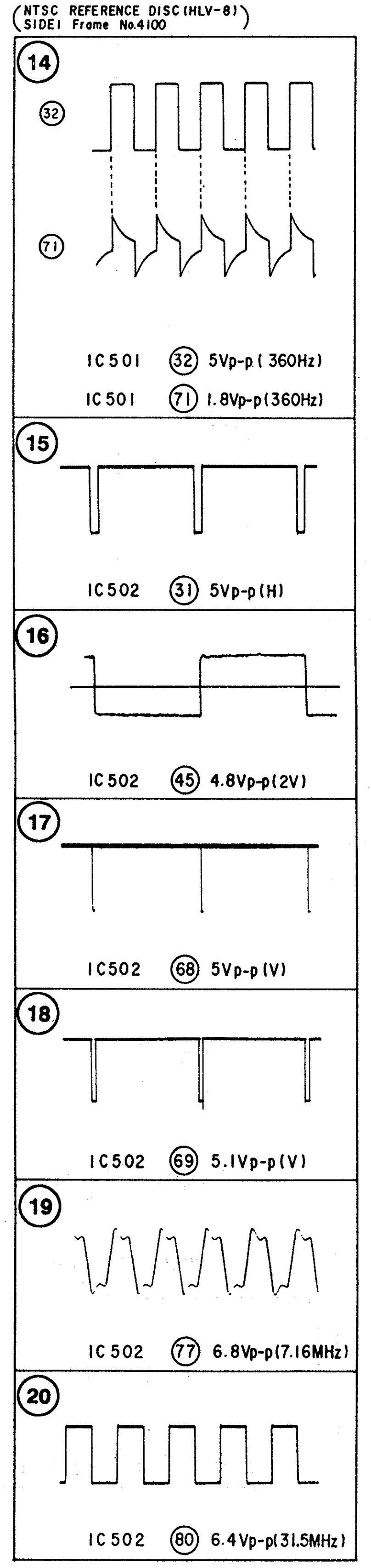

CN482
7
6
2
1
M
M481
LOADING
MOTOR
C481
5
1
CN481
1-654-464-
11


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
MD-705
(Mechanism Operation
Detect)
POWER BLOCK
PW-720
(Power Switch)
AX-705
(AUX IN)
MT-706
(Tilt Motor)
MT707
(Load Motor)
SW-732
(Load Chuck)
FP-744
(Display)
FP-745
(Play Switch)
FG-707
(Spindle FG Detect)
MA-711
(Mic)

MB-717 (SYSTEM CONTROL), MT-707 (LOADING MOTOR), SW-732 (LOAD CHUCK) SCHEMATIC DIAGRAM •Refer to page 4-6 for printed wiring board of MB-717 BOARD.

—Ref. No. MB-717 Board; 1,000 Series, MT-707 and SW-732 Boards; 4,000 Series—

MB-717 BOARD (3/4)
no mark : PAUSE mode.
(NTSC REFERENCE DISC (HLV-8) SIDE1 Frame No.4100)



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15
16
17
18
19
20
21
22
23
24
25
26
A
B
C
D
E
F
G
H
I
J
K
L
M
N
MB-717 BOARD (3/4)
(SYSCON BLOCK)
IC505
SPINDLE ERROR SIGNAL SELECT (LD/CD/CDV)
IC504
ERROR AMP
IC504
PHASE COMPENSATION
IC506
LD SPDL ERROR AMP
IC504
AMP
IC503
LOADING MOTOR DRIVE
IC502
SYSTEM CONTROL
IC501
SYSTEM CONTROL
Q501
SWITCH
Q502
DISC DET, LED ON/OFF SWITCH
SW-732 BOARD
PH461-463
LOAD CHUCK SWITCH
MT-707 BOARD
M481
LOADING MOTOR
TO (4/4) AUDIO BLOCK (See Page 4-23)
TO (1/4) VIDEO BLOCK (See Page 4-12)
TO (4/4) AUDIO BLOCK (See Page 4-24)
TO (1/4) VIDEO BLOCK (See Page 4-12, 13, 14)
TO (4/4) AUDIO BLOCK (See Page 4-23)
TO (4/4) AUDIO BLOCK (See Page 4-23)
TO (1/4) VIDEO BLOCK (See Page 4-13)
TO (4/4) AUDIO BLOCK (See Page 4-23)
FP-744 BOARD CN103 (See Page 4-35)
TO (4/4) AUDIO BLOCK (See page 4-26)
TO (2/4) SERVO BLOCK (See Page 4-15)
16

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

·SIGNAL PATH

Spindle servo (speed and phase)	⋙

no mark : PAUSE mode
(NTSC REFERENCE DISC (HLV-8) SIDE1 Frame No.4100)

Note:
If the "*" marked points are measured by the digital voltmeter, the voltage will greatly or the machine will be reset.

MB-717 (AUDIO), MA-711 (MIC) , AX-705 (AUX IN) SCHEMATIC DIAGRAM •Refer to page 4-6 for MB-717 board printed wiring board. •Refer to page 4-4 for MA-711/AX-705 boards printed wiring board.

—Ref. No. MB-717 Board; 1,000 Series, MA-711 and AX-705 Boards; 3,000 Series —

MB-717 BOARD (4/4)
(AUDIO BLOCK)
IC201 AUDIO D.S.P
IC202
IC203 AFM DEMOD CX NR
IC204 CD SPINDLE ERROR AMP
IC205 DIGIFIL & DAC
IC206 BUFFER
Q201, 202 AUDIO MUTE SWITCH
Q203, 204 AMP
Q205 MUTE SWITCH
Q206 INVERTER
Q207 CD/LD CDV SWITCH
Q214, 215 MUTE
Q210, 211 MUTE
AX-705 BOARD
MA-711 BOARD
IC301 MIC AMP
IC302 AMP
IC303 EQ AMP
IC304 BUFFER
IC304 MIX AMP
IC305 OTASUKE DETECT
IC701
IC702 AUDIO SELECT
IC703 KARAOKE DSP
IC704
IC705 BUFFER LPF
IC706 BUFFER LPF
IC707 LPF
SYNC DETECT
MIC 1
MIC 2
TO D/A SYSTEM CONTROL BLOCK (See Page 4-22)
TO D/A SERVO BLOCK (See Page 4-17)
TO D/A SYSTEM CONTROL BLOCK (See Page 4-20, 22)
TO D/A VIDEO BLOCK (See Page 4-12)
TO D/A VIDEO BLOCK (See Page 4-14)
TO VIDEO BLOCK (See page 4-12)
TO SYSTEM BLOCK (See page 4-20)
TO FP-745 BOARD CN002 (See Page 4-35)
(See Page 4-22) TO D/A SYSTEM CONTROL BLOCK
LINE OUT1
LINE OUT2
AUDIO
VIDEO
AUX
RES
SI
SICK
REMOTE CONT
MIC IN
H-DET
CS
MB-717BOARD(4/4)
no mark : PAUSE mode.
(NTSC REFERENCE DISC(HLV-8) SIDE1 Frame No.4100)
21
J203 VIDEO OUT(75Ω terminated) 1Vp-p (H)
22
IC205 15 4Vp-p (16.9344MHz)
no mark : PLAY mode
(NTSC REFERENCE DISC (HLV-8) SIDE2 Chapter Track No.16)

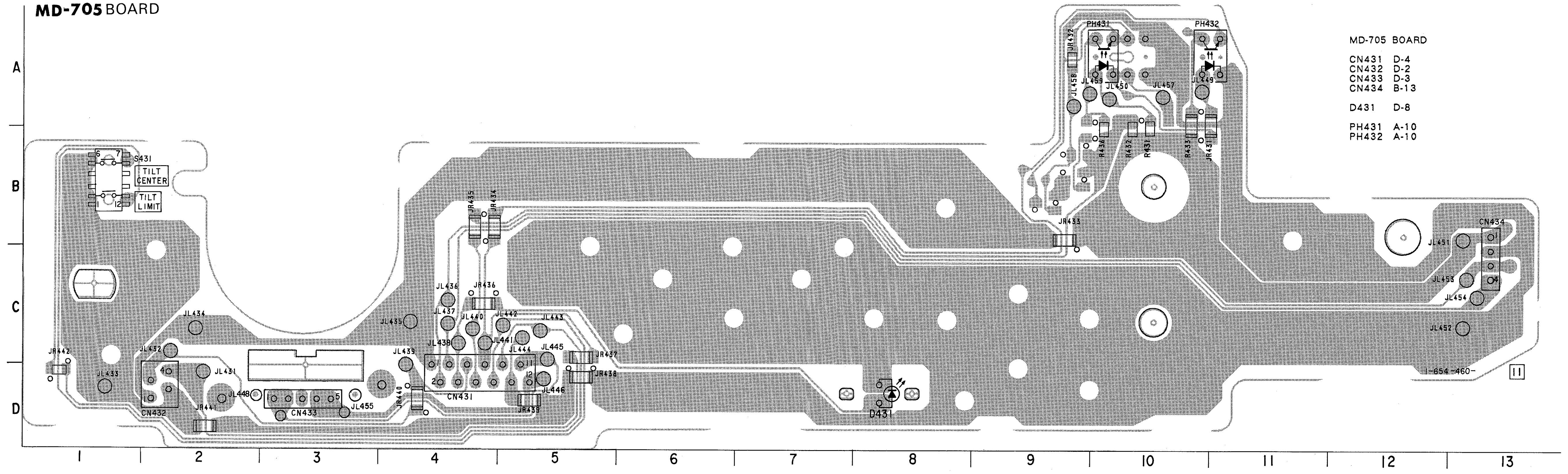
Note:
If the "*" marked points are measured by the digital voltmeter, the voltage will greatly or the machine will be reset.

•SIGNAL PATH

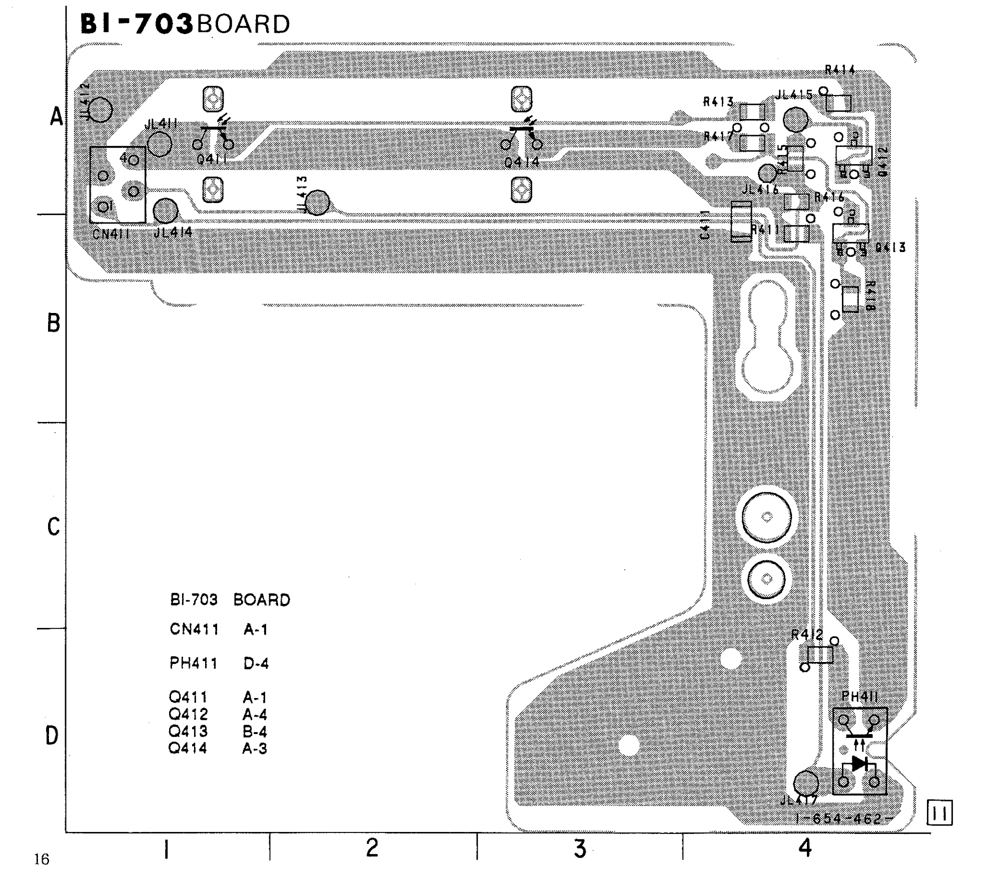
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB			⇨⟫	⇨

BI-703, MD-705 (MECHANISM OPERATION DETECT), FG-707 (SPINDLE FG DETECT), MT-706 (TILT MOTOR) PRINTED WIRING BOARDS

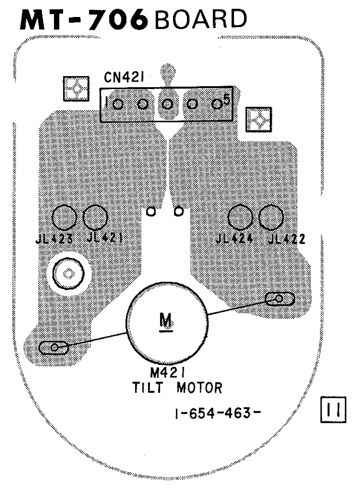
—Ref. No. BI-703, MD-705, FG-707 and MT-706 Boards; 2,000 Series—

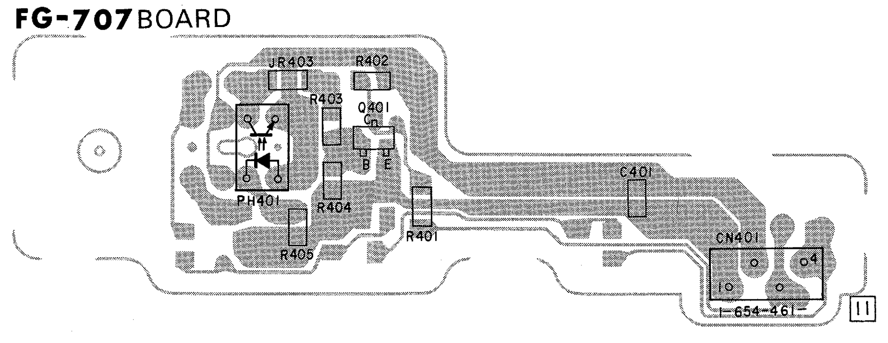

MD-705 BOARD
TILT CENTER
TILT LIMIT
CN431
CN432
CN433
CN434
D431
PH431
PH432
1-654-460-
A
B
C
D
1
2
3
4
5
6
7
8
9
10
11
12
13

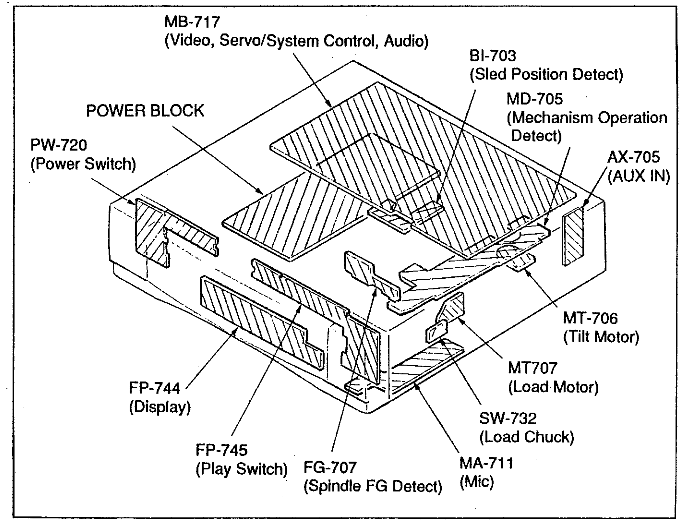
MD-705 BOARD	
CN431	D-4
CN432	D-2
CN433	D-3
CN434	B-13
D431	D-8
PH431	A-10
PH432	A-10


BI-703 BOARD
CN411
Q414
PH411
1-654-462-
A
B
C
D
1
2
3
4

BI-703 BOARD	
CN411	A-1
PH411	D-4
Q411	A-1
Q412	A-4
Q413	B-4
Q414	A-3

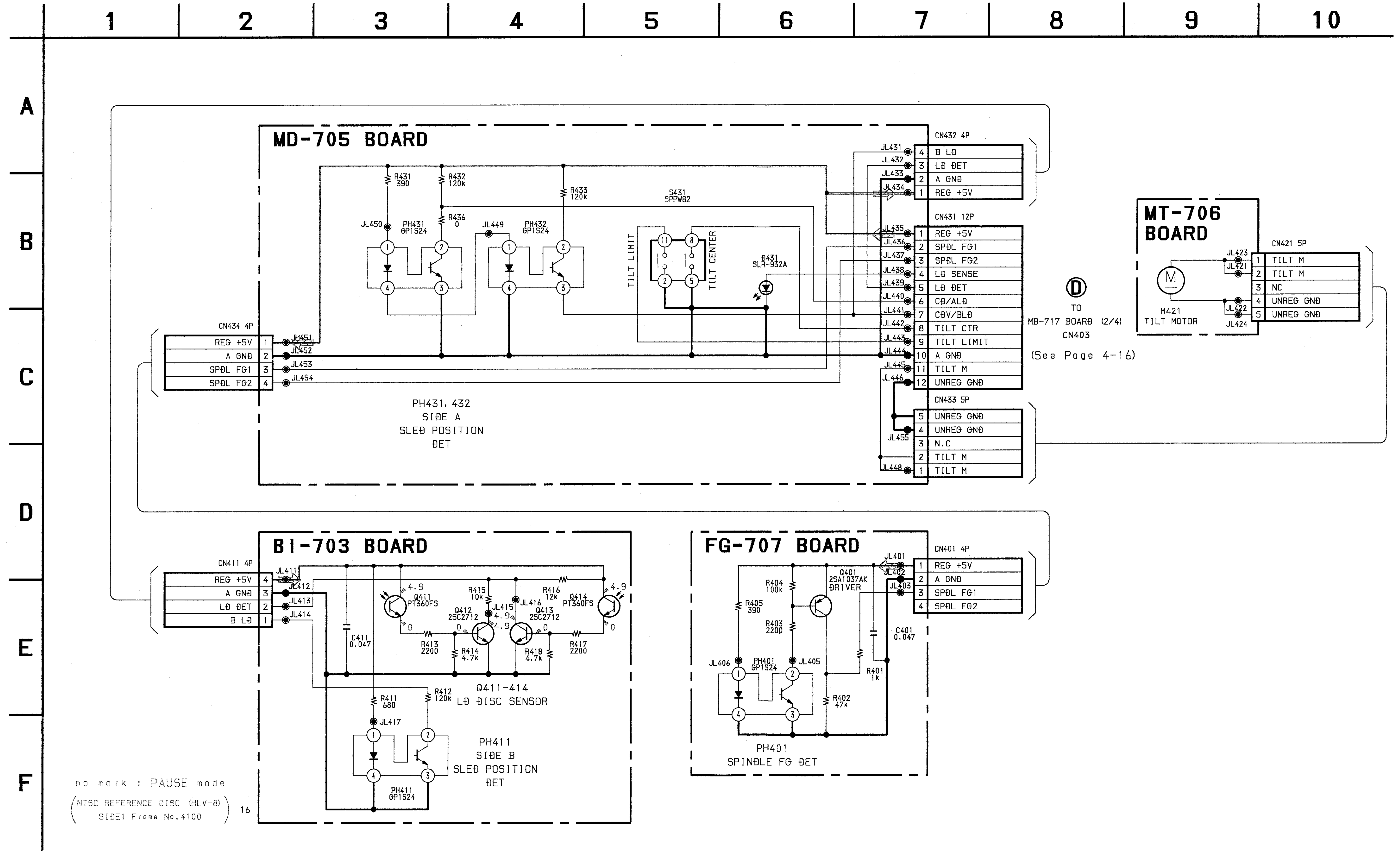

MT-706 BOARD
CN421
JL423
JL424
JL421
JL422
M
M421
TILT MOTOR
1-654-463-


FG-707 BOARD
PH401
R404
R405
R401
C401
CN401
1-654-461-


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
MD-705
(Mechanism Operation Detect)
POWER BLOCK
PW-720
(Power Switch)
AX-705
(AUX IN)
MT-706
(Tilt Motor)
MT707
(Load Motor)
SW-732
(Load Chuck)
MA-711
(Mic)
FP-744
(Display)
FP-745
(Play Switch)
FG-707
(Spindle FG Detect)

BI-703, MD-705 (MECHANISM OPERATION DETECT), FG-707 (SPINDLE FG DETECT), MT-706 (TILT MOTOR) SCHEMATIC DIAGRAM

—Ref. No. BI-703, MD-705, FG-707 and MT-706 Boards; 2,000 Series—


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
MD-705 BOARD
CN432 4P
4 B LD
3 LD DET
2 A GND
1 REG +5V
CN431 12P
1 REG +5V
2 SPDL FG1
3 SPDL FG2
4 LD SENSE
5 LD DET
6 CD/ALD
7 CDV/BLD
8 TILT CTR
9 TILT LIMIT
10 A GND
11 TILT M
12 UNREG GND
CN433 5P
5 UNREG GND
4 UNREG GND
3 N.C
2 TILT M
1 TILT M
CN434 4P
REG +5V
A GND
SPDL FG1
SPDL FG2
PH431
GP1S24
PH432
GP1S24
S431
SPPW82
TILT LIMIT
TILT CENTER
D431
SLR-332A
PH431, 432
SIDE A
SLED POSITION
DET
D
TO
MB-717 BOARD (2/4)
CN403
(See Page 4-16)
MT-706
BOARD
CN421 5P
1 TILT M
2 TILT M
3 NC
4 UNREG GND
5 UNREG GND
M421
TILT MOTOR
BI-703 BOARD
CN411 4P
REG +5V
A GND
LD DET
B LD
Q411
PT560FS
Q412
2SC2712
Q413
2SC2712
Q414
PT560FS
Q411-414
LD DISC SENSOR
PH411
SIDE B
SLED POSITION
DET
PH411
GP1S24
FG-707 BOARD
CN401 4P
1 REG +5V
2 A GND
3 SPDL FG1
4 SPDL FG2
Q401
2SA1037AK
DRIVER
PH401
GP1S24
PH401
SPINDLE FG DET

no mark : PAUSE mode

(NTSC REFERENCE DISC (HLV-8)
SIDE1 Frame No.4100) 16

FP-744 BOARD

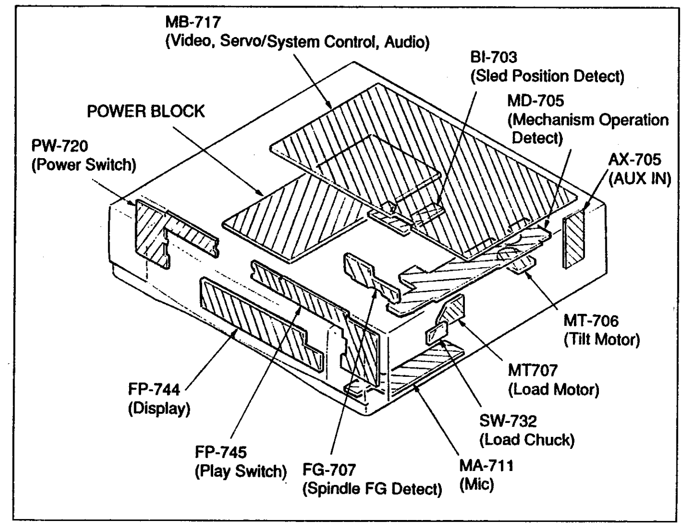
CN101	H-16
CN102	G-6
CN103	G-16
CN104	G-6
D101	D-8
D102	D-8
D103	D-8
D104	D-9
D105	D-9
D106	D-9
D107	D-9
D108	D-10
D109	D-10
D110	D-10
D111	E-15
D112	E-16
D113	E-17
D115	D-12
IC101	D-12
IC102	G-14
IC103	C-13
Q101	E-8
Q102	E-8
Q103	E-8
Q104	D-9
Q105	D-9
Q106	D-9
Q107	D-9
Q108	E-10
Q109	D-10
Q110	D-9
Q111	E-15
Q112	E-16
Q113	E-17
Q115	E-11
Q116	E-11
Q118	E-11
Q119	E-11
Q120	E-10
Q121	E-10
Q122	E-10
Q123	D-11
Q124	D-11
Q127	E-15
Q128	D-16
Q129	D-16

FP-745 BOARD

CN001	I-22
CN002	G-22
D001	A-15
D002	A-15
D003	B-19
D004	B-20
D005	B-21
D006	B-21
D007	B-20
D008	B-21
D009	C-21
D010	C-21
D011	D-20
IC001	B-19

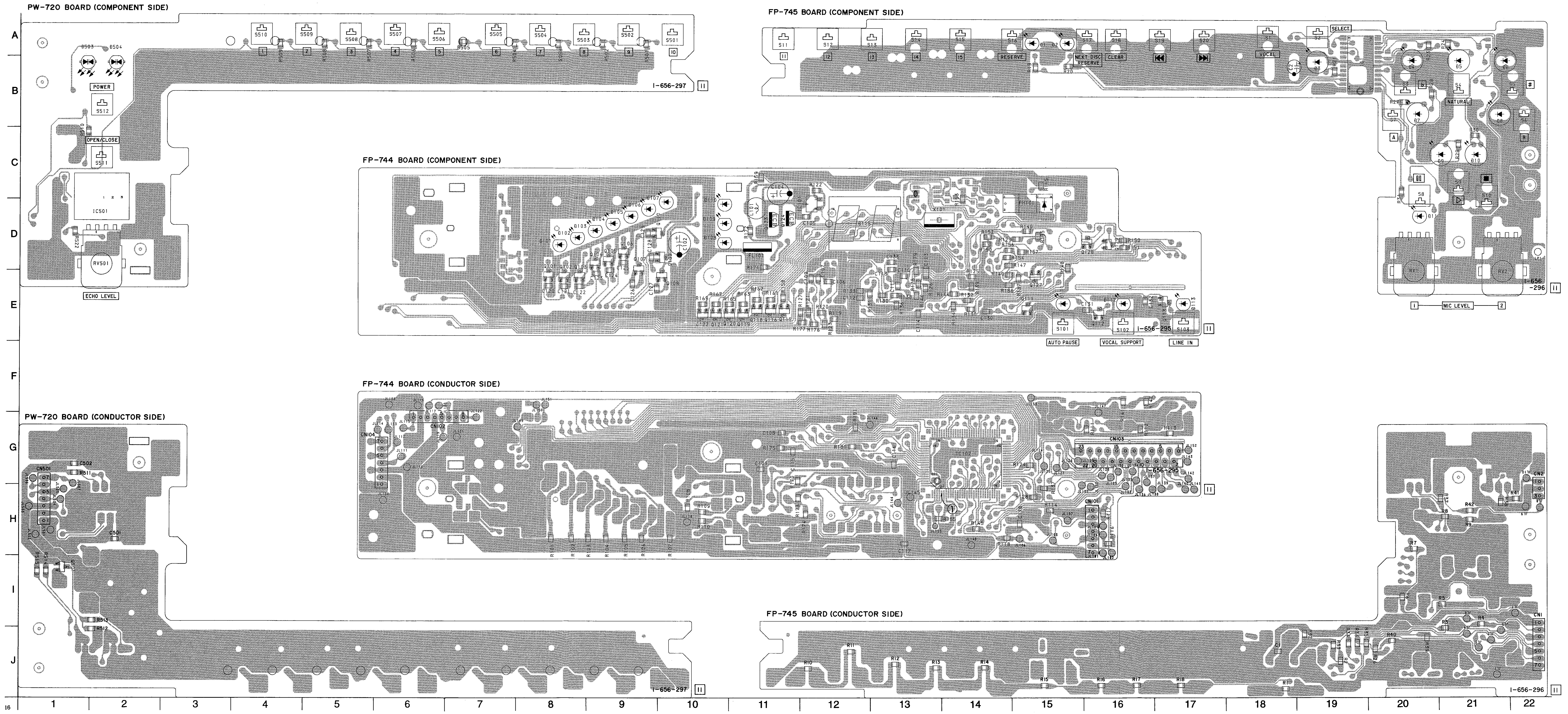
PW-720 BOARD

CN501	G-1
D503	A-1
D504	A-2
IC501	D-2
Q501	I-1


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
MD-705
(Mechanism Operation Detect)
AX-705
(AUX IN)
POWER BLOCK
PW-720
(Power Switch)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-744
(Display)
SW-732
(Load Chuck)
FP-745
(Play Switch)
FG-707
(Spindle FG Detect)
MA-711
(Mic)

FP-744 (DISPLAY), FP-745 (PLAY SWITCH), PW-720 (POWER SWITCH) PRINTED WIRING BOARDS

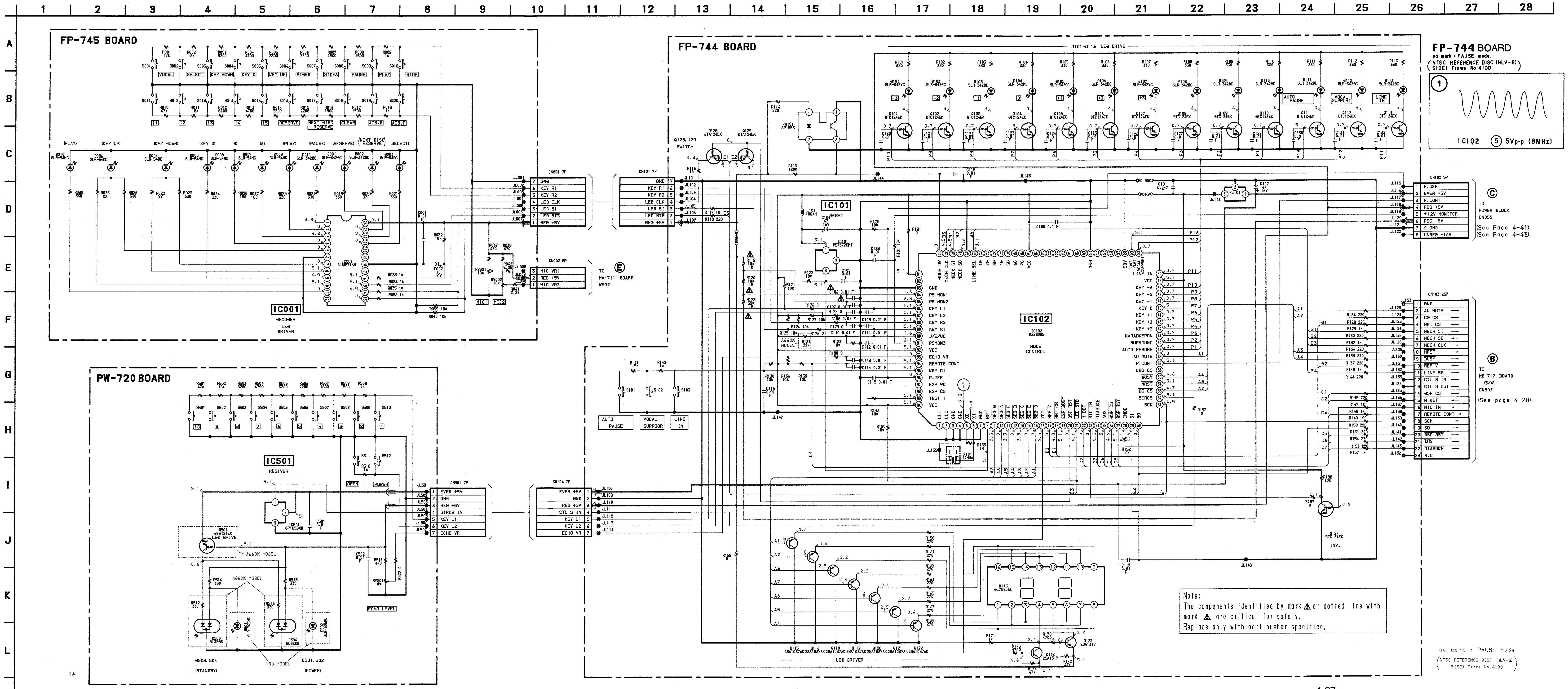
—Ref. No. FP-744, FP-745 and PW-720 Board; 3,000 Series—


PW-720 BOARD (COMPONENT SIDE)
FP-745 BOARD (COMPONENT SIDE)
FP-744 BOARD (COMPONENT SIDE)
FP-744 BOARD (CONDUCTOR SIDE)
PW-720 BOARD (CONDUCTOR SIDE)
FP-745 BOARD (CONDUCTOR SIDE)
POWER
OPEN/CLOSE
ECHO LEVEL
RESERVE
NEXT DISC
CLEAR
VOCAL
SELECT
NATURAL
MIC LEVEL
AUTO PAUSE
VOCAL SUPPORT
LINE IN
1-656-297
1-656-296
1-656-295
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

FRONT

FP-744 (DISPLAY), FP-745 (PLAY SWITCH), PW-720 (POWER SWITCH) SCHEMATIC DIAGRAMS

—Ref. No. FP-744, FP-745 and PW-720 Board; 3,000 Series—


FP-745 BOARD
FP-744 BOARD
PW-720 BOARD
IC001
DECODER LED DRIVER
IC101
RESET
IC102
MODE CONTROL
IC501
RESIVER
CN001 7P
CN002 3P
CN101 7P
CN102 8P
CN103 23P
CN104 7P
CN501 7P
TO MA-711 BOARD W302
TO POWER BLOCK CN052 (See Page 4-41) (See Page 4-43)
TO MB-717 BOARD (3/4) CN502 (See page 4-20)
Q101-Q113 LED DRIVE
Q128, 129 SWITCH
Q115-Q122 LED DRIVER
Q127 INV.
VOCAL
SELECT
KEY DOWN
KEY 0
KEY UP
SIDEB
SIDEA
PAUSE
PLAY
STOP
RESERVE
NEXT DISC RESERVE
CLEAR
ACS.R
ACS.F
AUTO PAUSE
VOCAL SUPPOR
LINE IN
OPEN
POWER
ECHO LEVEL
MIC1
MIC2
A660K MODEL
K50 MODEL
D503, 504 (STANDBY)
D501, 502 (POWER)
FP-744 BOARD
no mark : PAUSE mode.
(NTSC REFERENCE DISC (HLV-8) SIDE1 Frame No.4100)
①
IC102 ⑤ 5Vp-p (8MHz)

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

no mark : PAUSE mode
(NTSC REFERENCE DISC (HLV-8) SIDE1 Frame No.4100)

16

FRONT

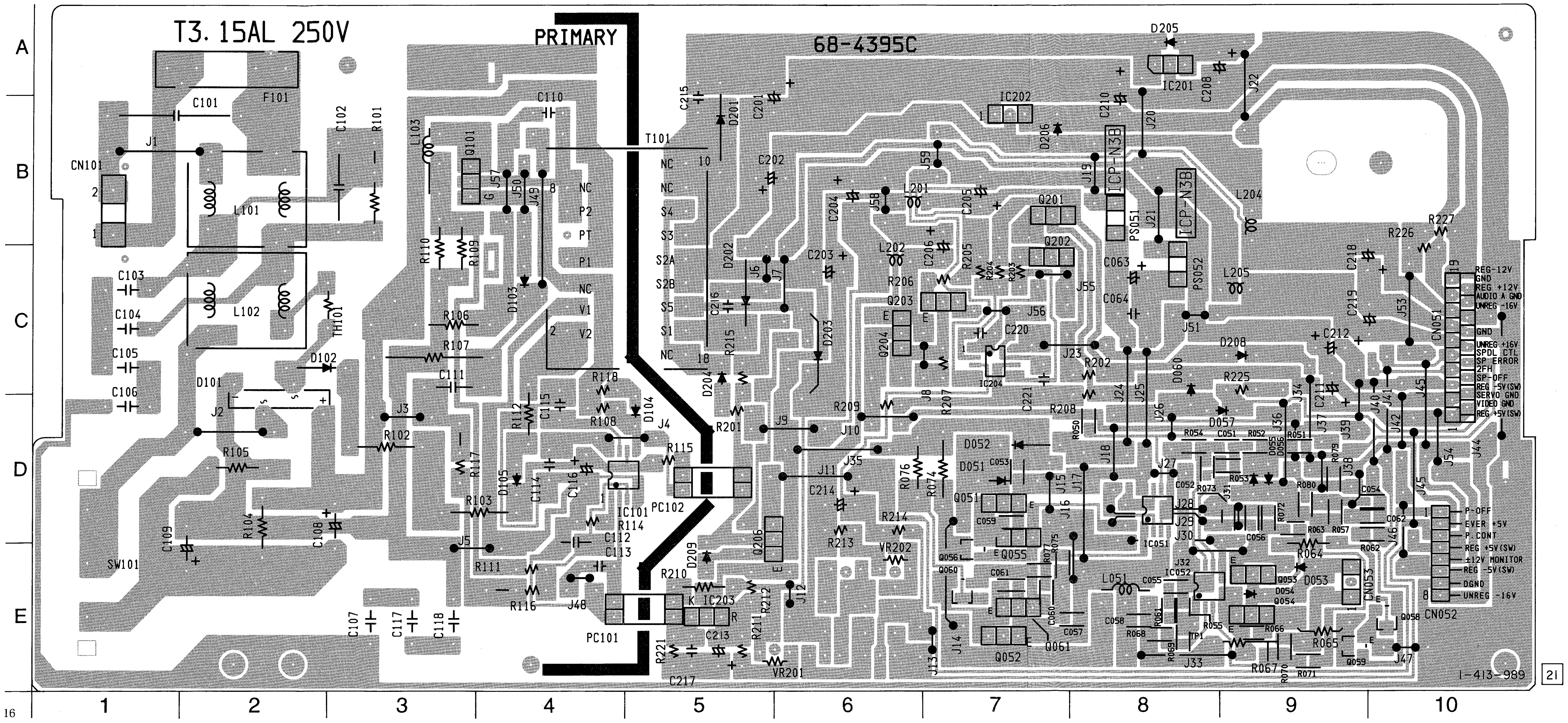
POWER BLOCK PRINTED WIRING BOARDS (MDP-A660K MODEL)

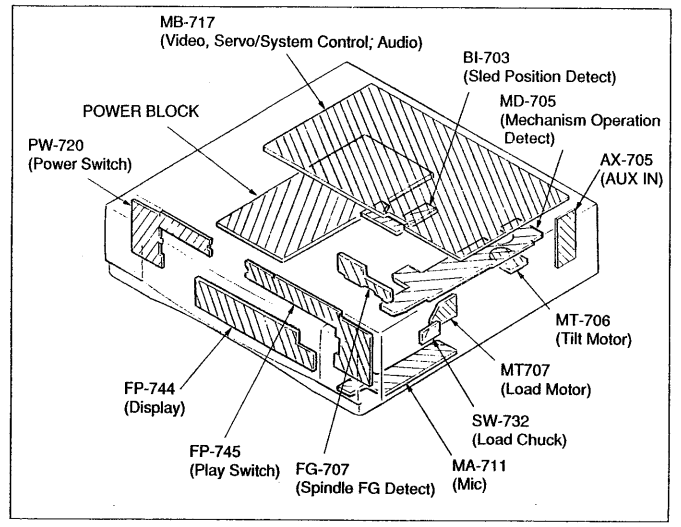
—Ref. No. POWER BLOCK; 5,000 Series—

POWER BLOCK

CN051	C–10	IC051	D–8
CN052	E–10	IC052	E–8
CN053	E–9	IC101	D–5
CN101	B–1	IC201	A–8
		IC202	B–7
D051	D–7	IC203	E–5
D052	D–7	IC204	C–7
D053	E–9		
D054	E–9	Q051	D–7
D055	D–9	Q052	E–7
D056	D–9	Q053	E–9
D057	D–9	Q054	E–9
D060	C–8	Q055	D–7
D101	D–2	Q056	E–7
D102	C–2	Q058	E–10
D103	C–4	Q059	E–9
D104	D–5	Q060	E–7
D105	D–4	Q061	E–7
D201	B–5	Q101	B–3
D202	C–5	Q201	B–7
D203	C–6	Q202	C–7
D204	C–5	Q203	C–7
D205	A–8	Q204	C–6
D206	B–7	Q206	D–5
D208	C–9		
D209	E–5	VR201	E–6
		VR202	E–6

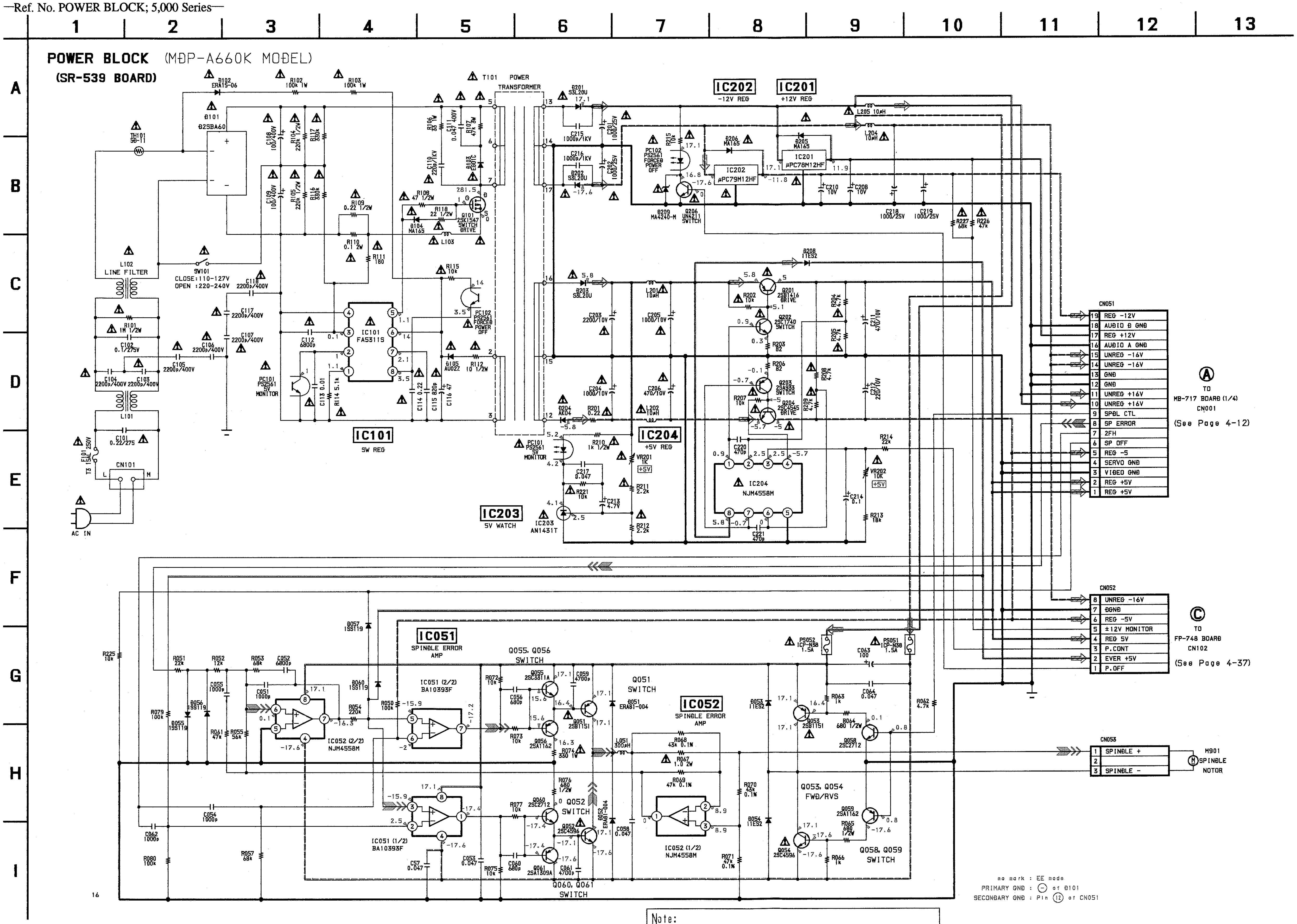
POWER BLOCK (A660K MODEL) (SR-539 BOARD)


T3.15AL 250V
PRIMARY
68-4395C
F101
CN101
T101
ICP-N3B
PS051
PS052
PC101
PC102
SW101
CN051
REG-12V
GND
REG +12V
AUDIO A GND
UNREG -16V
GND
UNREG +16V
SPDL CTL
SP ERROR
2FH
SP-OFF
REG -5V(SW)
SERVO GND
VIDEO GND
REG +5V(SW)
CN052
P-OFF
EVER +5V
P.CONT
REG +5V(SW)
±12V MONITOR
REG -5V(SW)
DGND
UNREG -16V
1-413-989
21
A
B
C
D
E
16
1
2
3
4
5
6
7
8
9
10


MB-717
(Video, Servo/System Control; Audio)
BI-703
(Sled Position Detect)
POWER BLOCK
MD-705
(Mechanism Operation Detect)
PW-720
(Power Switch)
AX-705
(AUX IN)
MT-706
(Tilt Motor)
MT707
(Load Motor)
FP-744
(Display)
SW-732
(Load Chuck)
FP-745
(Play Switch)
FG-707
(Spindle FG Detect)
MA-711
(Mic)

POWER BLOCK SCHEMATIC DIAGRAMS (MDP-A660K MODEL)

—Ref. No. POWER BLOCK; 5,000 Series—


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
POWER BLOCK (MDP-A660K MODEL)
(SR-539 BOARD)
T101 POWER TRANSFORMER
IC202 -12V REG
IC201 +12V REG
IC101 SW REG
IC204 +5V REG
IC203 5V WATCH
IC051 SPINDLE ERROR AMP
IC052 SPINDLE ERROR AMP
Q055, Q056 SWITCH
Q051 SWITCH
Q052 SWITCH
Q053, Q054 FWD/RVS
Q058, Q059 SWITCH
Q060, Q061 SWITCH
L102 LINE FILTER
S101 CLOSE: 110-127V OPEN: 220-240V
CN101
AC IN
CN051
19 REG -12V
18 AUDIO B GND
17 REG +12V
16 AUDIO A GND
15 UNREG -16V
14 UNREG -16V
13 GND
12 GND
11 UNREG +16V
10 UNREG +16V
9 SPDL CTL
8 SP ERROR
7 2FH
6 SP OFF
5 REG -5
4 SERVO GND
3 VIDEO GND
2 REG +5V
1 REG +5V
Ⓐ TO MB-717 BOARD (1/4) CN001 (See Page 4-12)
CN052
8 UNREG -16V
7 DGND
6 REG -5V
5 ±12V MONITOR
4 REG 5V
3 P.CONT
2 EVER +5V
1 P.OFF
Ⓒ TO FP-748 BOARD CN102 (See Page 4-37)
CN053
1 SPINDLE +
2
3 SPINDLE -
M901 SPINDLE MOTOR
no mark : EE mode
PRIMARY GND : ⊖ of D101
SECONDARY GND : Pin ⑫ of CN051

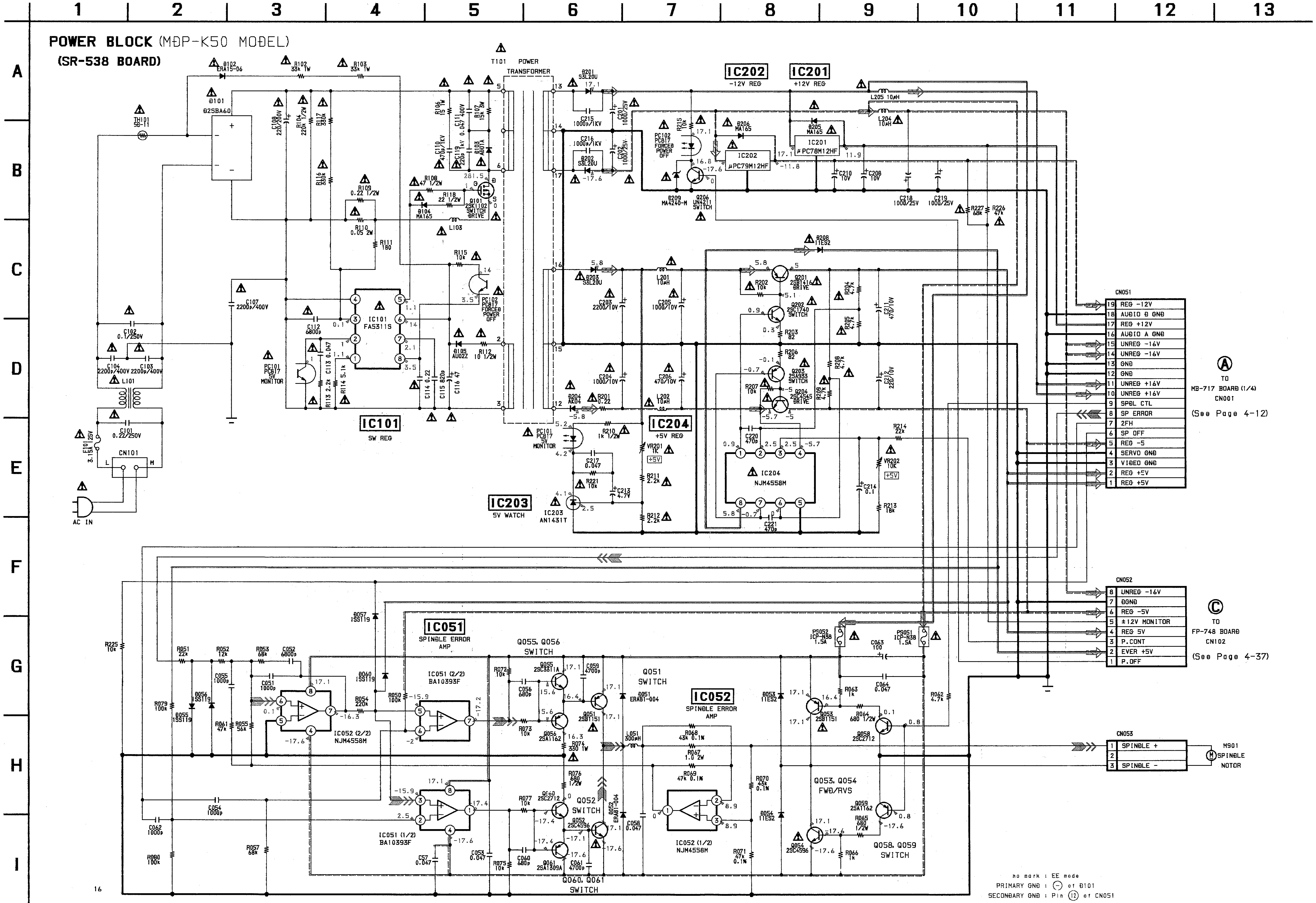
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

·SIGNAL PATH

Spindle servo (speed and phase)	⋙

POWER BLOCK PRINTED WIRING BOARDS (MDP-K50 MODEL)

—Ref. No. POWER BLOCK; 5,000 Series—


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
POWER BLOCK (MDP-K50 MODEL)
(SR-538 BOARD)
T101 POWER TRANSFORMER
IC202 -12V REG
IC201 +12V REG
IC202 μPC79M12HF
IC201 μPC78M12HF
IC101 SW REG
IC101 FA5311S
IC204 +5V REG
IC204 NJM4558M
IC203 5V WATCH
IC203 AN1431T
IC051 SPINDLE ERROR AMP
IC051 (2/2) BA10393F
IC051 (1/2) BA10393F
IC052 (2/2) NJM4558M
IC052 SPINDLE ERROR AMP
IC052 (1/2) NJM4558M
Q055, Q056 SWITCH
Q051 SWITCH
Q052 SWITCH
Q053, Q054 FWD/RVS
Q058, Q059 SWITCH
Q060, Q061 SWITCH
Q101 2SK1102 SWITCH DRIVE
Q201 2SB1416 DRIVE
Q202 2SC1740 SWITCH
Q203 2SA933 SWITCH
Q204 2SC4545 DRIVE
Q204 UN4211 SWITCH
PC101 PC817 5V MONITOR
PC102 PC817 FORCED POWER OFF
D101 D2SBA60
F101 3.15A 125V
THD101
CN101
AC IN
PS052 ICP-N38 1.5A
PS051 ICP-N38 1.5A
CN051
19 REG -12V
18 AUDIO D GND
17 REG +12V
16 AUDIO A GND
15 UNREG -16V
14 UNREG -16V
13 GND
12 GND
11 UNREG +16V
10 UNREG +16V
9 SPDL CTL
8 SP ERROR
7 2FH
6 SP OFF
5 REG -5
4 SERVO GND
3 VIDEO GND
2 REG +5V
1 REG +5V
Ⓐ TO MB-717 BOARD (1/4) CN001
(See Page 4-12)
CN052
8 UNREG -16V
7 DGND
6 REG -5V
5 ±12V MONITOR
4 REG 5V
3 P.CONT
2 EVER +5V
1 P.OFF
Ⓒ TO FP-748 BOARD CN102
(See Page 4-37)
CN053
1 SPINDLE +
2
3 SPINDLE -
M901 SPINDLE MOTOR

no mark : EE mode
PRIMARY GND : ⊖ of D101
SECONDARY GND : Pin ⑫ of CN051

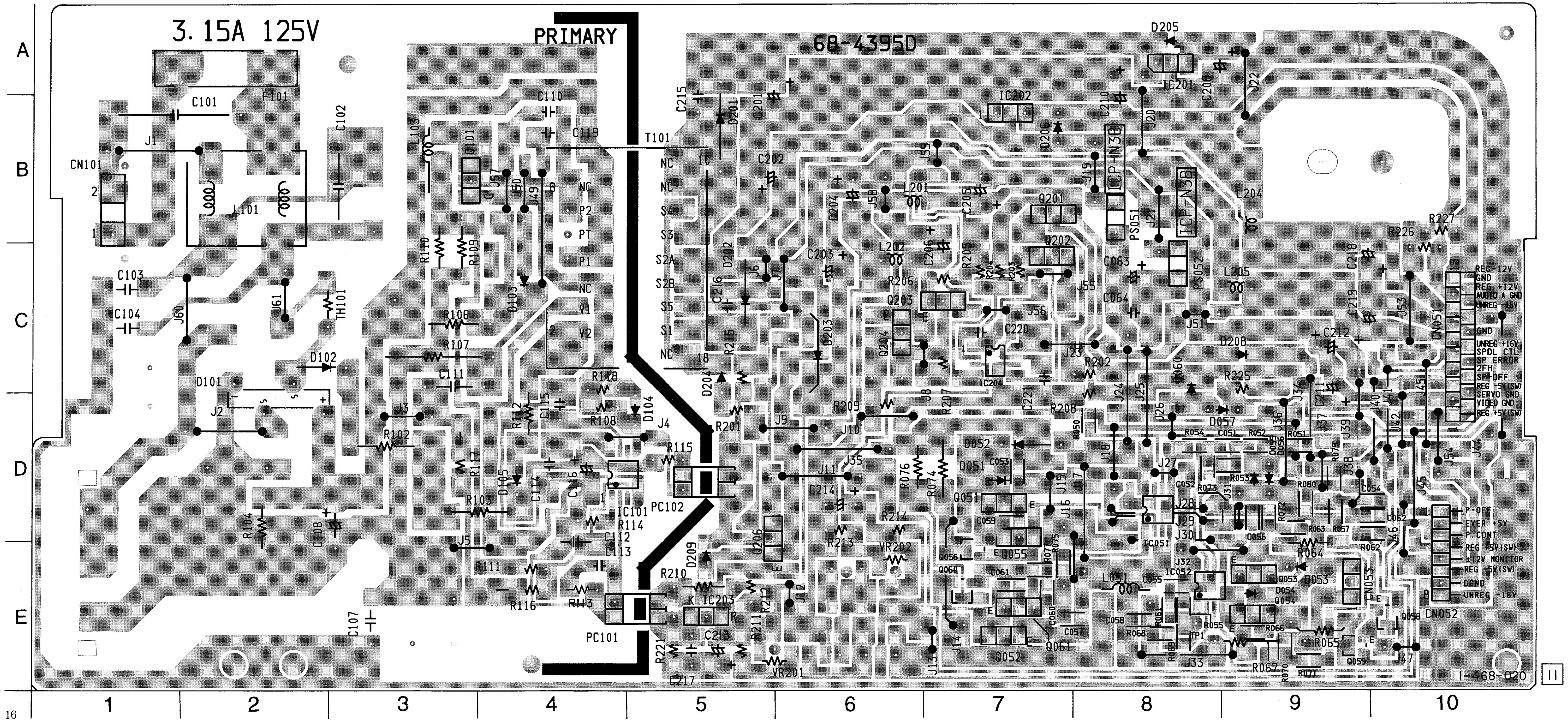
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

·SIGNAL PATH

Spindle servo (speed and phase)	⋙

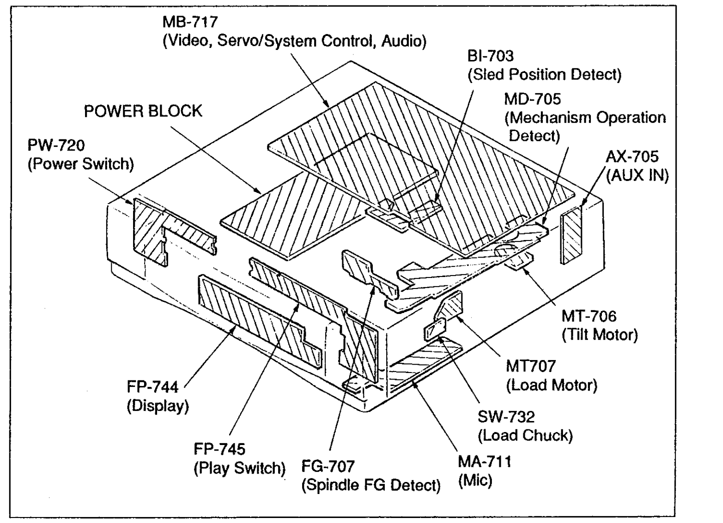
POWER BLOCK **SCHEMATIC DIAGRAMS (MDP-K50 MODEL)**
—Ref. No. POWER BLOCK; 5,000 Series—

POWER BLOCK (K50 MODEL) (SR-538 BOARD)


3.15A 125V
PRIMARY
68-4395D
F101
C101
C102
CN101
L101
T101
IC101
IC201
IC202
IC203
IC204
PC101
PC102
CN051
CN052
CN053
ICP-N38
PS051
PS052
REG-12V
GND
REG +12V
AUDIO A GND
UNREG -16V
GND
UNREG +16V
SPDL CTL
SP ERROR
2FH
SP-OFF
REG -5V(SW)
SERVO GND
VIDEO GND
REG +5V(SW)
P-OFF
EVER +5V
P.CONT
REG +5V(SW)
±12V MONITOR
REG -5V(SW)
DGND
UNREG -16V
1-468-020
11
A
B
C
D
E
1
2
3
4
5
6
7
8
9
10
16

POWER BLOCK

CN051	C–10	IC051	D–8
CN052	E–10	IC052	E–8
CN053	E–9	IC101	D–5
CN101	B–1	IC201	A–8
		IC202	B–7
D051	D–7	IC203	E–5
D052	D–7	IC204	C–7
D053	E–9		
D054	E–9	Q051	D–7
D055	D–9	Q052	E–7
D056	D–9	Q053	E–9
D057	D–9	Q054	E–9
D060	C–8	Q055	D–7
D101	D–2	Q056	E–7
D102	C–2	Q058	E–10
D103	C–4	Q059	E–9
D104	D–5	Q060	E–7
D105	D–4	Q061	E–7
D201	B–5	Q101	B–3
D202	C–5	Q201	B–7
D203	C–6	Q202	C–7
D204	C–5	Q203	C–7
D205	A–8	Q204	C–6
D206	B–7	Q206	D–5
D208	C–9		
D209	E–5	VR201	E–6
		VR202	E–6


MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
MD-705
(Mechanism Operation Detect)
POWER BLOCK
PW-720
(Power Switch)
AX-705
(AUX IN)
MT-706
(Tilt Motor)
MT707
(Load Motor)
SW-732
(Load Chuck)
FP-744
(Display)
FP-745
(Play Switch)
FG-707
(Spindle FG Detect)
MA-711
(Mic)

SECTION 5
REPAIR PARTS LIST

5-1. EXPLODED VIEWS

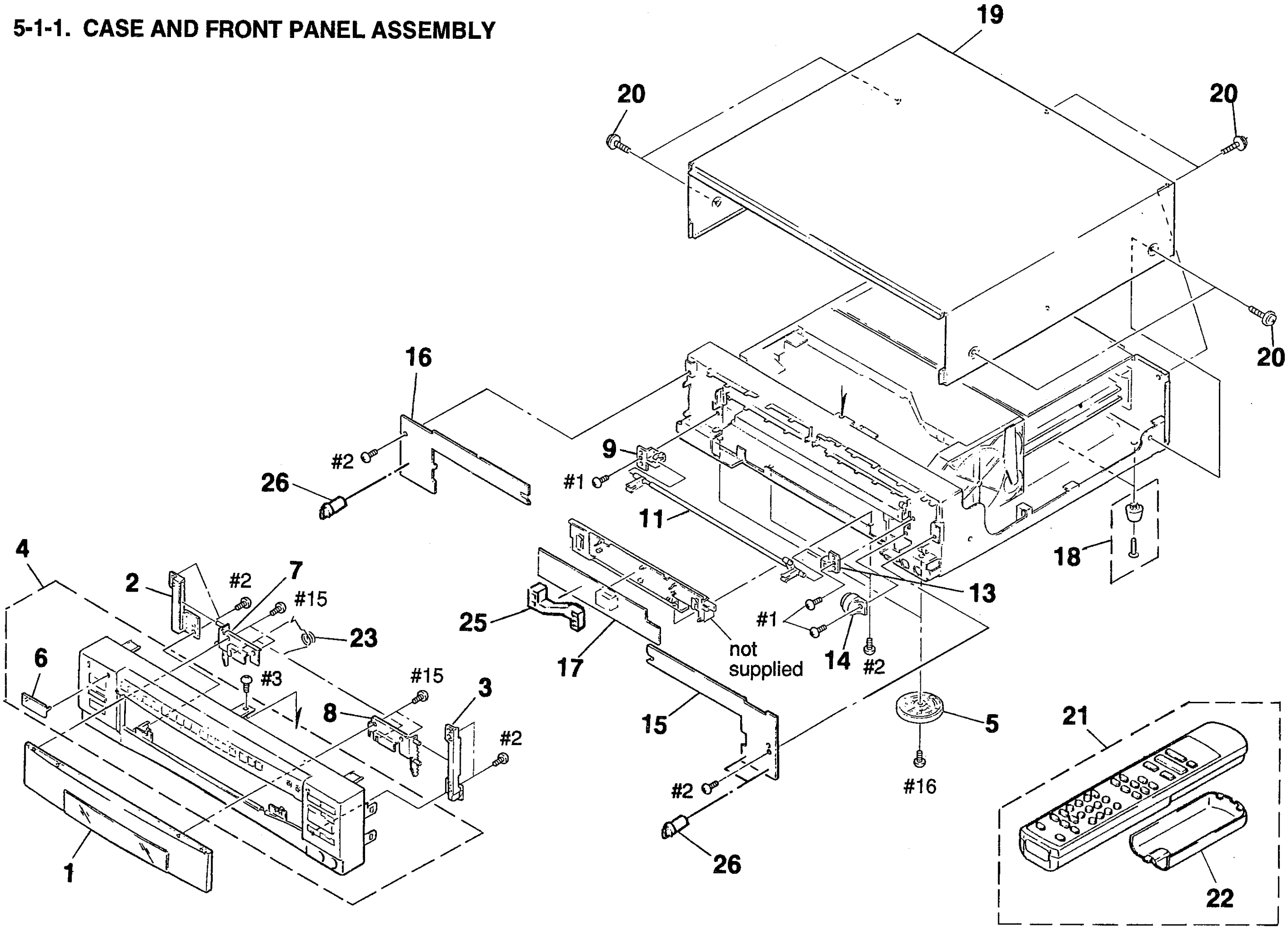
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) ... (RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (#mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

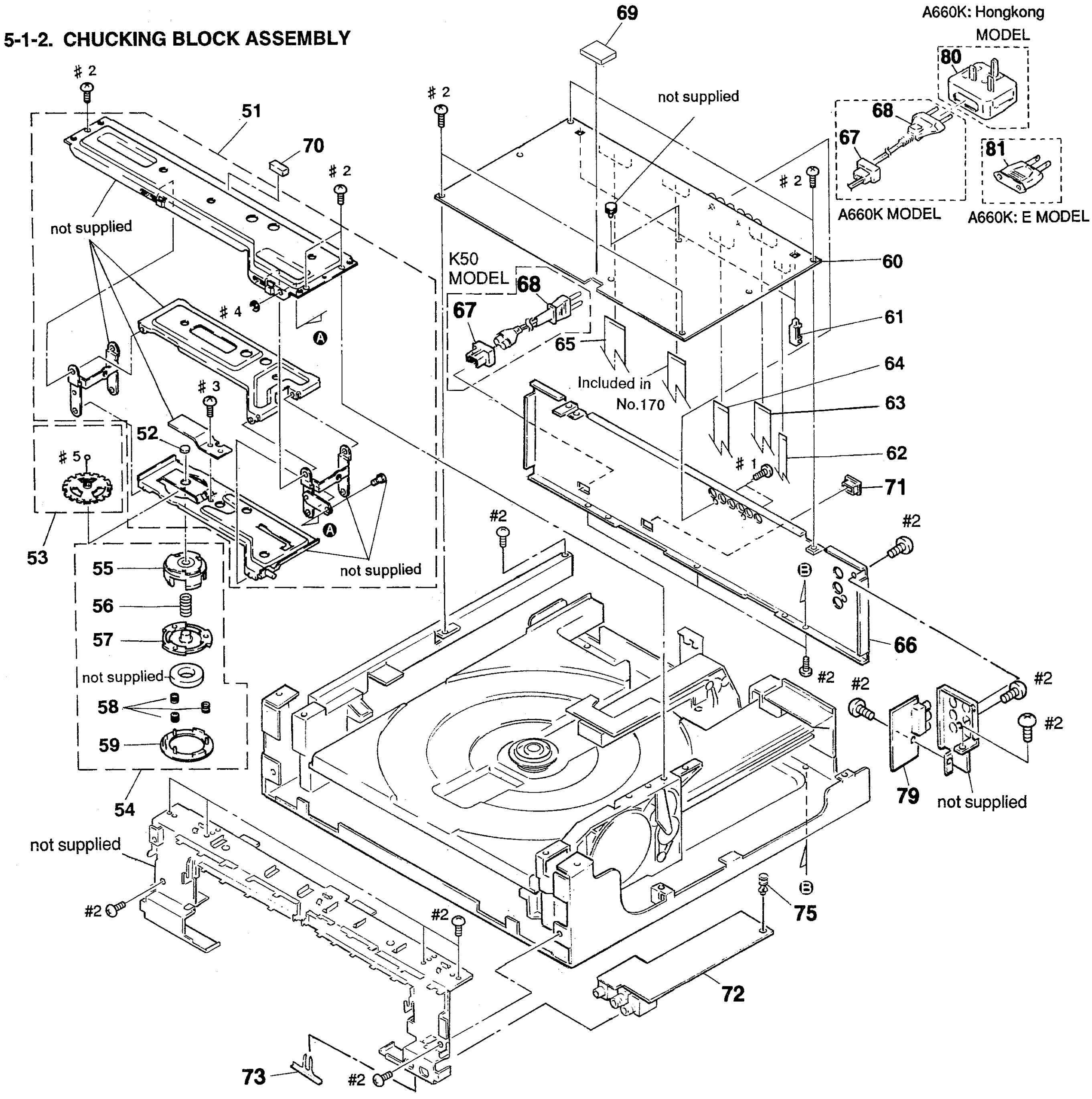
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifie.

5-1-1. CASE AND FRONT PANEL ASSEMBLY



Ref. No.	Part No.	Description	Remarks
1	X-3944-677-1	DOOR ASSY	
2	3-961-801-01	HOLDER (L), SLIDE	
3	3-961-802-01	HOLDER (R), SLIDE	
4	X-3944-672-1	PANEL ASSY, FRONT (K50)	
4	X-3944-675-1	PANEL ASSY, FRONT (A660K)	
5	X-3942-810-1	FOOT ASSY	
6	3-942-768-02	EMBLEM (NO.5), SONY	
7	3-961-818-01	DISK (L), DOOR	
8	3-961-819-01	DISK (R), DOOR	
9	3-961-800-01	GUIDE, LINK	
11	X-3944-955-1	LINK ASSY	
13	3-963-178-01	HOLDER, LINK	
14	4-919-393-01	DAMPER	
* 15	A-6423-313-A	FP-745 BOARD, COMPLETE	
* 16	A-6423-320-A	PW-720 BOARD, COMPLETE	
* 17	A-6423-319-A	FP-744 BOARD, COMPLETE	
18	3-961-156-11	FOOT	
* 19	3-961-785-01	CASE, UPPER	
20	3-710-901-41	SCREW, TAPPING	
21	1-473-110-21	REMOTE COMMANDER (RMT-M36A)	
22	3-959-554-01	COVER BATTERY	
23	3-961-931-01	SPRING, DOOR	
* 25	3-961-916-01	REFLECTOR (A)	
26	3-962-010-11	KNOB, VOL	

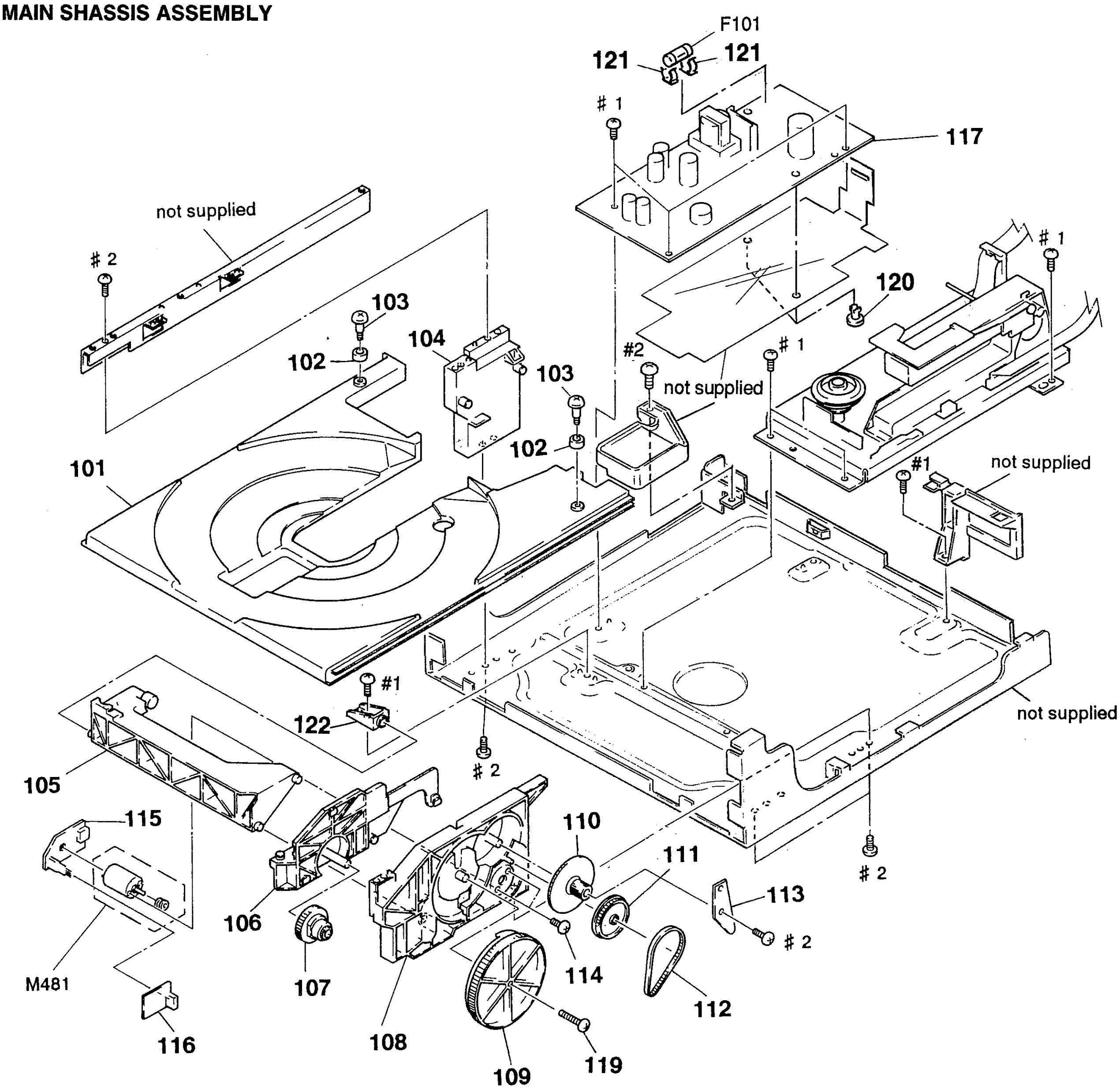
5-1-2. CHUCKING BLOCK ASSEMBLY


69
A660K: Hongkong MODEL
80
not supplied
68
67
81
A660K MODEL
A660K: E MODEL
# 2
51
70
# 2
not supplied
# 4
A
K50 MODEL
68
67
65
Included in No.170
60
61
64
63
62
71
# 1
# 3
52
# 5
53
55
56
57
not supplied
58
59
54
A
not supplied
#2
B
66
#2
#2
#2
#2
79
not supplied
not supplied
#2
#2
B
75
72
73
#2

Ref. No.	Part No.	Description	Remarks
51	A-6415-896-A	CHUCKING SUB BLOCK ASSY	
52	3-953-392-01	RETAINER, THRUST	
53	X-3942-787-1	PLATE ASSY, TOP	
54	A-6415-644-G	CHUCK BLOCK ASSY	
55	3-953-288-01	PLATE, CHUCKING	
56	3-953-291-01	SPRING (1), COMPRESSION	
57	X-3942-776-1	HOLDER ASSY, MAGNET	
58	3-953-290-01	SPRING (2), COMPRESSION	
59	X-3943-043-1	GUIDE (B) ASSY, CENTER	
* 60	A-6423-318-A	MB-717 BOARD, COMPLETE	
* 61	3-962-283-01	GUIDE, MB	
62	1-769-653-11	CABLE, FLAT (FFC) 7 ARBOR	
63	1-769-655-11	CABLE, FLAT (FFC) 23 ARBOR	
64	1-769-654-11	CABLE, FLAT (FFC) 12 ARBOR	
65	1-769-652-11	CABLE, FLAT (FFC) 19 ARBOR	
* 66	3-961-786-61	PANEL, REAR(A660K:E)	
* 66	3-961-786-71	PANEL, REAR(K50)	
* 66	3-961-786-91	PANEL, REAR(A660K:Chinese, Hongkong)	
⚠67	1-526-985-11	AC INLET (K50)	
⚠67	3-703-244-00	BUSHING (2104), CORD (A660K)	
⚠68	1-574-085-11	CORD, POWER (K50)	
⚠68	1-575-912-21	CORD, POWER (A660K)	
69	3-728-465-01	CUSHION, OPT	
70	9-911-840-XX	CUSHION (U)	
* 71	3-961-821-01	SELECOVER, VOL (A660K:E)	
* 72	A-6423-316-A	MA-711 BOARD, COMPLETE	
73	3-955-377-01	PLATE (2GANG), MOUNT	
75	3-531-576-11	RIVET	
* 79	A-6423-317-A	AX-705 BOARD, COMPLETE	
80	1-770-019-11	ADAPTOR, CONVERSION(A660K:Hongkong)	
81	1-569-008-11	ADAPTOR, CONVERSION 2P(A660K:E)	

Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

5-1-3. MAIN SHASSIS ASSEMBLY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121
121
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117
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# 2
103
104
102
#2
# 1
120
# 1
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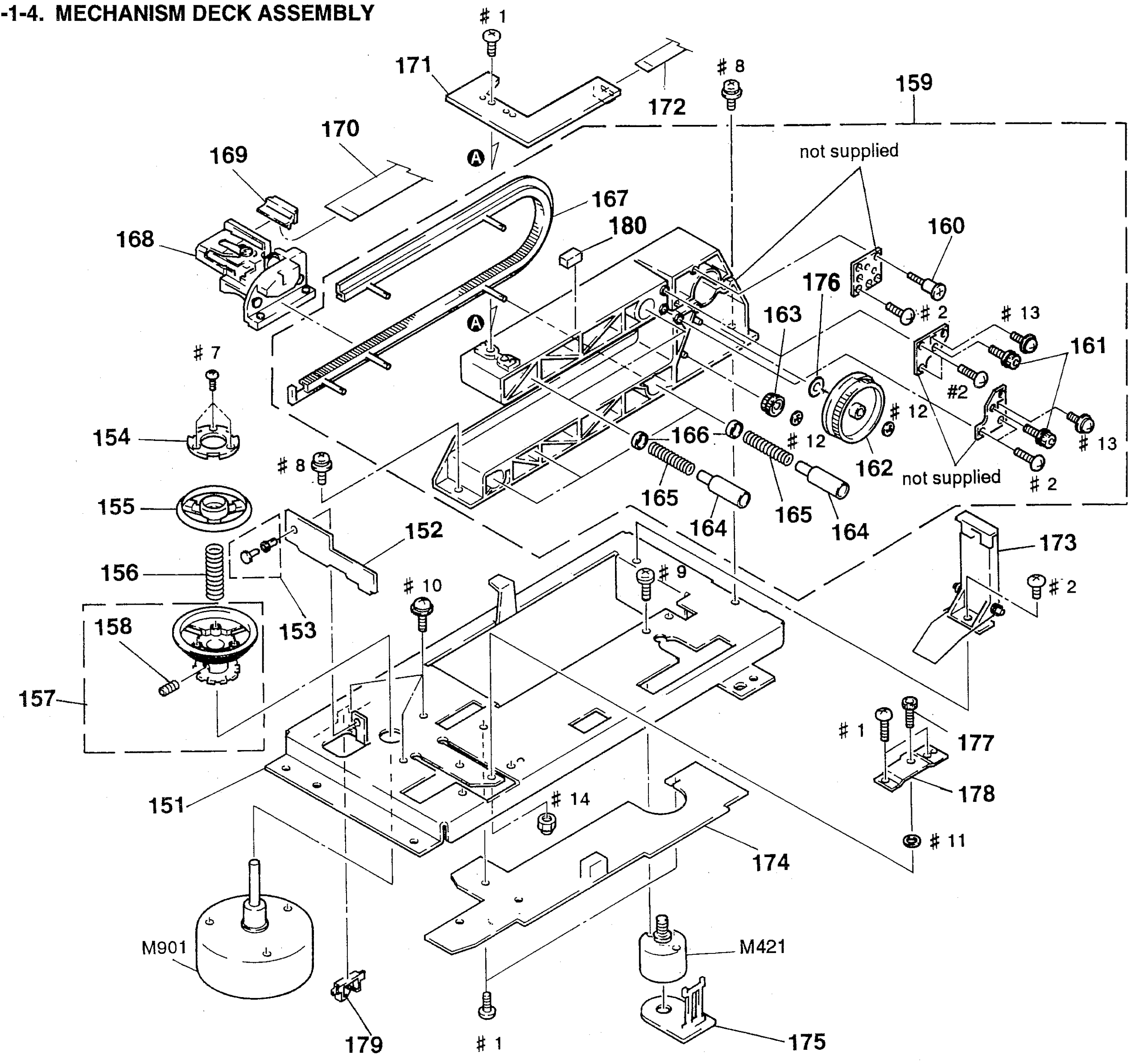
102
101
#1
not supplied
# 1
not supplied
122
105
# 2
115
110
111
113
# 2
106
107
114
# 2
M481
112
116
108
119
109

Ref. No.	Part No.	Description	Remarks
101	A-6415-895-A	TRAY (91U) ASSY	
* 102	4-914-248-01	STOPPER, RUBBER	
103	3-963-090-01	SCREW, TRAY STOPPER	
* 104	X-3944-730-1	STAY (L) ASSY, F	
* 105	X-3944-729-1	FRAME ASSY, TRAY UD	
106	X-3944-514-1	BASE ASSY, L SUB	
107	3-961-085-01	GEAR, IDLER	
108	X-3944-513-1	BASE ASSY, LOADING	
109	3-961-083-01	GEAR, CONTROL	
110	3-961-081-01	GEAR, MIDDLE	
111	3-961-084-01	PULLEY (A)	
112	3-961-082-01	BELT, TIMING	
* 113	3-962-050-01	STAY, REINFORCEMENT	

Ref. No.	Part No.	Description	Remarks
114	3-962-049-01	SCREW, MOTOR STOPPER	
* 115	1-654-464-11	MT-707 BOARD	
* 116	A-6423-303-A	SW-732 BOARD, COMPLETE	
117	1-413-989-21	POWER BLOCK (A660K)	
117	1-468-020-11	POWER BLOCK (K50)	
119	3-962-812-01	SCREW (+BV 3X18)	
120	3-531-576-11	RIVET	
⚠121	1-533-223-11	HOLDER, FUSE	
* 122	3-961-101-11	HOLDER, UD FRAME	
⚠F101	1-532-286-11	FUSE TIMELUG (3.15A 250V) (A660K)	
⚠F101	1-532-745-11	FUSE TIMELUG (3.15A 125V) (K50)	
M481	1-541-309-11	MOTOR, LOADING (RF-370C)	

Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

5-1-4. MECHANISM DECK ASSEMBLY


# 1
171
172
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159
170
169
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167
180
168
160
176
# 2
# 13
163
161
#2
# 7
# 12
154
166
# 12
# 13
# 8
162
not supplied
# 2
155
165
164
165
164
152
173
156
# 10
# 9
# 2
158
153
157
# 1
177
151
178
# 14
# 11
174
M901
M421
179
# 1
175

Ref. No.	Part No.	Description	Remarks
* 151	3-961-112-01	PLATE, BASE	
* 152	A-6423-231-A	FG-707 BOARD, COMPLETE	
* 153	3-954-681-01	RIVET, NYLON	
154	3-953-293-01	PLATE (C), YOKE	
155	3-953-292-01	GUIDE, CENTER	
156	3-953-289-01	SPRING (3), COMPRESSION	
157	X-3942-779-1	TURNTABLE ASSY	
158	3-701-507-00	SET SCREW, DOUBLE POINT, (M3X5)	
* 159	A-6404-121-A	BASE BLOCK ASSY, FEED	
160	3-961-208-01	SCREW, FLEXIBLE DISPOSITION	
161	3-899-249-01	BOLT, HEXAGON SOCKET	
162	3-953-254-01	CAM, TILT DRIVING	
163	3-953-259-01	GEAR, TILT MIDWAY	
164	3-953-255-03	HOLDER, U	
165	3-953-267-01	SPRING, COMPRESSION	
166	3-953-830-01	WASHER, U	
167	3-961-126-01	GUIDE (900), U	
⚠168	8-848-286-11	DEVICE, OPTICAL KHS-150A	
169	3-953-268-01	HOLDER (18P), FLEXIBLE	
170	1-751-083-11	CABLE, FLEXIBLE FLAT (18 CORE)	
* 171	A-6423-232-A	BI-703 BOARD, COMPLETE	
172	1-769-680-11	CABLE, FLAT (FFC) 4 ARBOR	
* 173	A-6404-111-A	STAND ASSY, FLEXIBLE RETAINER	
* 174	A-6423-230-A	MD-705 BOARD, COMPLETE	
* 175	A-6423-229-A	MT-706 BOARD, COMPLETE	
176	3-701-439-21	WASHER	
177	3-953-829-01	BOLT	
* 178	3-953-258-11	PLATE, ADJUSTMENT, AT	
* 179	3-961-199-01	SADDLE, EDGE	
180	9-911-841-XX	CUSHION, RUBBER	
M421	X-3944-693-1	TILT MOTOR ASSY	
M901	1-698-109-11	MOTOR, DD (SPINDLE)	

Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

5-2. ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifie.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be defferent from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... ,
  uPB... , μ PB... , uPC... , μPC... ,
  uPD..., μPD...
- CAPACITORS:
  uF: μF
- COILS
  uH: μH

Ref. No.	Part No.	Description			Remarks
*	A-6423-317-A	AX-705 BOARD, COMPLETE			
		**********************			
		(Ref.No.2,000 Series)			
		< CAPACITOR >			
C701	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C702	1-124-927-11	ELECT	4.7uF	20%	100V
C703	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C704	1-124-927-11	ELECT	4.7uF	20%	100V
C706	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
		< CONNECTOR >			
CN701	1-506-485-11	PIN, CONNECTOR 6P			
		< DIODE >			
D701	8-719-800-76	DIODE 1SS226			
D702	8-719-800-76	DIODE 1SS226			
		< FILTER >			
FL701	1-424-031-11	FILTER, NOISE			
FL702	1-424-031-11	FILTER, NOISE			
		< JACK >			
J701	1-764-592-31	JACK 3P (LINE IN)			
		< JUMPER RESISTOR >			
JR701	1-216-295-91	CONDCTOR, CHIP (2012)			
		< PIN >			
L LP701	4-352-844-01	PIN, LEAD, COATING			
		< TRANSISTOR >			
Q701	8-729-231-55	TRANSISTOR 2SC2878-AB			
		< RESISTOR >			
R702	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R703	1-216-097-00	METAL CHIP	100K	5%	1/10W
R704	1-216-097-00	METAL CHIP	100K	5%	1/10W
R705	1-216-097-00	METAL CHIP	100K	5%	1/10W
R706	1-216-097-00	METAL CHIP	100K	5%	1/10W
R707	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R709	1-216-022-00	METAL CHIP	75	5%	1/10W
R710	1-216-073-00	METAL CHIP	10K	5%	1/10W
**					
*	A-6423-232-A	BI-703 BOARD, COMPLETE			
		**********************			
		(Ref.No.2,000 Series)			
	3-953-261-01	HOLDER, PD			
		< CAPACITOR >			
C411	1-163-075-00	CERAMIC CHIP	0.047uF		50V
		< CONNECTOR >			
CN411	1-691-063-21	HOUSING, CONNECTOR 4P			
		< PHOTO INTERUPTER >			
PH411	8-729-020-74	DIODE GP1S24			
		< TRANSISTOR >			
Q411	8-729-904-10	TRANSISTOR PT360FS			
Q412	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q413	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q414	8-729-904-10	TRANSISTOR PT360FS			
		< RESISTOR >			
R411	1-216-045-00	METAL CHIP	680	5%	1/10W
R412	1-216-099-00	METAL CHIP	120K	5%	1/10W
R413	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R414	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R415	1-216-073-00	METAL CHIP	10K	5%	1/10W
R416	1-216-075-00	METAL CHIP	12K	5%	1/10W
R417	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R418	1-216-065-00	METAL CHIP	4.7K	5%	1/10W

****

* A-6423-231-A FG-707 BOARD, COMPLETE

****

(Ref.No.2,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remarks
C401	1-163-035-00	CERAMIC CHIP	0.047uF		50V

< CONNECTOR >

Ref. No.	Part No.	Description
CN401	1-691-863-11	CONNECTOR, BOARD TO BOARD

< JUMPER RESISTOR >

Ref. No.	Part No.	Description			Remarks
JR403	1-216-296-00	METAL CHIP	0	5%	1/8W

< PHOTO INTERUPTER >

Ref. No.	Part No.	Description
PH401	8-729-020-74	DIODE GP1S24

< TRANSISTOR >

Ref. No.	Part No.	Description	
Q401	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR

< RESISTOR >

Ref. No.	Part No.	Description			Remarks
R401	1-216-198-91	METAL GLAZE	1K	5%	1/8W
R402	1-216-089-00	METAL CHIP	47K	5%	1/10W
R403	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R404	1-216-097-00	METAL CHIP	100K	5%	1/10W
R405	1-216-039-00	METAL CHIP	390	5%	1/10W

****

* A-6423-319-A FP-744 BOARD, COMPLETE

****

(Ref.No.3,000 Series)

* 3-961-919-01 HOLDER, SEGMENT

< CAPACITOR >

Ref. No.	Part No.	Description			Remarks
C101	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C102	1-124-589-11	ELECT	47uF	20%	16V
C103	1-163-077-91	CERAMIC CHIP	0.1uF		50V
C104	1-124-589-11	ELECT	47uF	20%	16V
C105	1-163-031-11	CERAMIC CHIP	0.01uF		50V
⚠C106	1-164-232-11	CERAMIC CHIP	0.01uF		50V
⚠C107	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C108	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C109	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C110	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C111	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C112	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C113	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C114	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C115	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C116	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C117	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C118	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C120	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C121	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C122	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C123	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C124	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C125	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C126	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C127	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C128	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C129	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C130	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C131	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C132	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C133	1-163-031-11	CERAMIC CHIP	0.01uF		50V

< CONNECTOR >

Ref. No.	Part No.	Description
CN101	1-506-486-11	PIN, CONNECTOR 7P
CN102	1-506-487-11	PIN, CONNECTOR 8P
CN103	1-691-652-11	SOCKET, CONNECTOR 23P
CN104	1-506-486-11	PIN, CONNECTOR 7P

< DIODE >

Ref. No.	Part No.	Description	
D101	8-719-045-62	DIODE	SLR-342VC-A-47
D102	8-719-051-17	DIODE	SLR-342DCT31
D103	8-719-051-17	DIODE	SLR-342DCT31
D104	8-719-045-64	DIODE	SLR-342MC-A-47
D105	8-719-051-17	DIODE	SLR-342DCT31
D106	8-719-051-17	DIODE	SLR-342DCT31
D107	8-719-045-62	DIODE	SLR-342VC-A-47
D108	8-719-051-17	DIODE	SLR-342DCT31
D109	8-719-051-17	DIODE	SLR-342DCT31
D110	8-719-045-64	DIODE	SLR-342MC-A-47
D111	8-719-051-17	DIODE	SLR-342DCT31
D112	8-719-051-17	DIODE	SLR-342DCT31
D113	8-719-051-17	DIODE	SLR-342DCT31
D115	8-719-047-76	DIODE	GL7D206L

Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description	Remarks
		< FILTER >	
FL101	1-424-031-11	FILTER, NOISE	
		< IC >	
IC101	8-759-074-40	IC PST572DMT-T1	
IC102	8-759-336-62	IC MB89096PF-G-172-BND	
IC103	8-759-276-29	IC XL9020F-S-E2	
		< COIL >	
L101	1-408-982-21	INDUCTOR 100uH	
		< PHOTO INTERUPTER >	
PH101	8-749-010-69	PHOTO INTERUPTER GP158V	
		< TRANSISTOR >	
Q101	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q102	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q103	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q104	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q105	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q106	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q107	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q108	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q109	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q110	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q111	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q112	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q113	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q115	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q116	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q118	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q119	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q120	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q121	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q122	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q123	8-729-820-16	TRANSISTOR 2SA1317-S	
Q124	8-729-820-16	TRANSISTOR 2SA1317-S	
Q127	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q128	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q129	8-729-027-31	TRANSISTOR DTA124EKA-T146	
		< RESISTOR >	
R101	1-216-037-00	METAL CHIP 330 5% 1/10W	
R102	1-216-037-00	METAL CHIP 330 5% 1/10W	
R103	1-216-037-00	METAL CHIP 330 5% 1/10W	
R104	1-216-037-00	METAL CHIP 330 5% 1/10W	
R105	1-216-037-00	METAL CHIP 330 5% 1/10W	
R106	1-216-037-00	METAL CHIP 330 5% 1/10W	
R107	1-216-037-00	METAL CHIP 330 5% 1/10W	
R108	1-216-037-00	METAL CHIP 330 5% 1/10W	
R109	1-216-037-00	METAL CHIP 330 5% 1/10W	
R110	1-216-037-00	METAL CHIP 330 5% 1/10W	
R111	1-216-037-00	METAL CHIP 330 5% 1/10W	
R112	1-216-037-00	METAL CHIP 330 5% 1/10W	
R113	1-216-037-00	METAL CHIP 330 5% 1/10W	
R114	1-216-033-00	METAL CHIP 220 5% 1/10W	
R115	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R116	1-216-001-00	METAL CHIP 10 5% 1/10W	
R117	1-216-001-00	METAL CHIP 10 5% 1/10W	
R118	1-216-033-00	METAL CHIP 220 5% 1/10W	
⚠R119	1-208-806-11	METAL CHIP 10K 0.50% 1/10W	
⚠R120	1-208-806-11	METAL CHIP 10K 0.50% 1/10W	
R121	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R122	1-216-073-00	METAL CHIP 10K 5% 1/10W	
⚠R123	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R124	1-216-033-00	METAL CHIP 220 5% 1/10W	
R125	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R126	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R127	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R128	1-216-033-00	METAL CHIP 220 5% 1/10W	
R129	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R130	1-216-033-00	METAL CHIP 220 5% 1/10W	
R131	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R132	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R133	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R134	1-216-033-00	METAL CHIP 220 5% 1/10W	
R135	1-216-033-00	METAL CHIP 220 5% 1/10W	
R136	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R137	1-216-033-00	METAL CHIP 220 5% 1/10W	
R138	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R139	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R140	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R141	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R142	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R144	1-216-033-00	METAL CHIP 220 5% 1/10W	
R145	1-216-033-00	METAL CHIP 220 5% 1/10W	
R146	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R147	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R148	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R149	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R150	1-216-033-00	METAL CHIP 220 5% 1/10W	
R151	1-216-033-00	METAL CHIP 220 5% 1/10W	
R152	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R153	1-216-295-91	CONDCTOR, CHIP (2012)	

Note:	**Note:**
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description	Remarks
R154	1-216-033-00	METAL CHIP 220 5%	1/10W
R155	1-216-121-00	METAL CHIP 1M 5%	1/10W
R156	1-216-033-00	METAL CHIP 220 5%	1/10W
R157	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R158	1-216-035-00	METAL CHIP 270 5%	1/10W
R159	1-216-295-91	CONDCTOR, CHIP (2012)	
R161	1-216-035-00	METAL CHIP 270 5%	1/10W
R162	1-216-035-00	METAL CHIP 270 5%	1/10W
R163	1-216-035-00	METAL CHIP 270 5%	1/10W
R165	1-216-035-00	METAL CHIP 270 5%	1/10W
R167	1-216-035-00	METAL CHIP 270 5%	1/10W
	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R169	1-216-035-00	METAL CHIP 270 5%	1/10W
R170	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R171	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R172	1-216-089-00	METAL CHIP 47K 5%	1/10W
R173	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R174	1-216-089-00	METAL CHIP 47K 5%	1/10W
R175	1-216-073-00	METAL CHIP 10K 5%	1/10W
R176	1-216-295-91	CONDCTOR, CHIP (2012)	
R177	1-216-295-91	CONDCTOR, CHIP (2012)	
R178	1-216-295-91	CONDCTOR, CHIP (2012)	
R179	1-216-295-91	CONDCTOR, CHIP (2012)	
R180	1-216-295-91	CONDCTOR, CHIP (2012)	
R181	1-216-073-00	METAL CHIP 10K 5%	1/10W
R187	1-216-295-91	CONDCTOR, CHIP (2012)	
R188	1-216-073-00	METAL CHIP 10K 5%	1/10W
R190	1-216-073-00	METAL CHIP 10K 5%	1/10W
R191	1-216-295-91	CONDCTOR, CHIP (2012)	

< SWITCH >

Ref. No.	Part No.	Description	Remarks
S101	1-762-365-21	SWITCH, TACTILE (AUTO PAUSE)	
S102	1-762-365-21	SWITCH, TACTILE (VOCAL SUPPORT)	
S103	1-762-365-21	SWITCH, TACTILE (LINE IN)	

< VIBRATOR >

Ref. No.	Part No.	Description	Remarks
X101	1-579-952-21	VIBRATOR, CERAMIC 8MHz	

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* A-6423-313-A FP-745 BOARD, COMPLETE

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(Ref.No.3,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description	Remarks
C001	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C002	1-126-157-11	ELECT 10uF 20%	16V

< CONNECTOR >

Ref. No.	Part No.	Description	Remarks
* CN001	1-568-784-21	PIN, CONNECTOR 7P	
CN002	1-506-468-11	PIN, CONNECTOR 3P	

< DIODE >

Ref. No.	Part No.	Description	Remarks
D001	8-719-051-17	DIODE SLR-342DCT31	
D002	8-719-051-17	DIODE SLR-342DCT31	
D003	8-719-302-07	LED SEL1810A	
D004	8-719-302-07	LED SEL1810A	
D005	8-719-955-04	LED PY5504S-1	
D006	8-719-302-07	LED SEL1810A	
D007	8-719-955-04	LED PY5504S-1	
D008	8-719-955-04	LED PY5504S-1	
D009	8-719-955-04	LED PY5504S-1	
D010	8-719-955-04	LED PY5504S-1	
D011	8-719-051-17	DIODE SLR-342DCT31	

< IC >

Ref. No.	Part No.	Description	Remarks
IC001	8-759-342-19	IC NJU3716M-T2	

< RESISTOR >

Ref. No.	Part No.	Description	Remarks
R001	1-216-089-00	METAL CHIP 47K 5%	1/10W
R002	1-216-079-00	METAL CHIP 18K 5%	1/10W
R003	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R004	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R005	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R006	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R007	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R008	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
R009	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R010	1-216-089-00	METAL CHIP 47K 5%	1/10W
R011	1-216-079-00	METAL CHIP 18K 5%	1/10W
R012	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R013	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R014	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R015	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R016	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R017	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
R018	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R019	1-216-037-00	METAL CHIP 330 5%	1/10W
R020	1-216-037-00	METAL CHIP 330 5%	1/10W
R021	1-216-037-00	METAL CHIP 330 5%	1/10W
R023	1-216-037-00	METAL CHIP 330 5%	1/10W
R024	1-216-037-00	METAL CHIP 330 5%	1/10W
R026	1-216-037-00	METAL CHIP 330 5%	1/10W
R027	1-216-031-00	METAL CHIP 180 5%	1/10W
R028	1-216-031-00	METAL CHIP 180 5%	1/10W
R029	1-216-037-00	METAL CHIP 330 5%	1/10W
R030	1-216-037-00	METAL CHIP 330 5%	1/10W
R031	1-216-037-00	METAL CHIP 330 5%	1/10W
R032	1-216-073-00	METAL CHIP 10K 5%	1/10W

Ref. No.	Part No.	Description			Remarks
R033	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R034	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R035	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R036	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R037	1-216-041-00	METAL CHIP	470	5%	1/10W
R038	1-216-041-00	METAL CHIP	470	5%	1/10W
R039	1-216-073-00	METAL CHIP	10K	5%	1/10W
R040	1-216-073-00	METAL CHIP	10K	5%	1/10W
R041	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R042	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

< VARIABLE RESISTOR >

RV001	1-241-646-11	RES, VAR, CARBON 10K (MIC 1)
RV002	1-241-646-11	RES, VAR, CARBON 10K (MIC 2)

< SWITCH >

S001	1-762-365-21	SWITCH, TACTILE (VOCAL)
S002	1-762-365-21	SWITCH, TACTILE (SELECT)
S003	1-762-365-21	SWITCH, TACTILE (b)
S004	1-762-365-21	SWITCH, TACTILE (NATURAL)
S005	1-762-365-21	SWITCH, TACTILE (#)
S006	1-762-365-21	SWITCH, TACTILE (B)
S007	1-762-365-21	SWITCH, TACTILE (A)
S008	1-762-365-21	SWITCH, TACTILE (❚❚)
S009	1-762-365-21	SWITCH, TACTILE (▷)
S010	1-762-365-21	SWITCH, TACTILE (■)
S011	1-762-365-21	SWITCH, TACTILE (11)
S012	1-762-365-21	SWITCH, TACTILE (12)
S013	1-762-365-21	SWITCH, TACTILE (13)
S014	1-762-365-21	SWITCH, TACTILE (14)
S015	1-762-365-21	SWITCH, TACTILE (15)
S016	1-762-365-21	SWITCH, TACTILE (RESERVE)
S017	1-762-365-21	SWITCH, TACTILE (NEXT DISC)
S018	1-762-365-21	SWITCH, TACTILE (CLEAR)
S019	1-762-365-21	SWITCH, TACTILE (⏮)
S020	1-762-365-21	SWITCH, TACTILE (⏭)

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* A-6423-316-A MA-711 BOARD, COMPLETE
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(Ref.No.3,000 Series)

< CAPACITOR >

C302	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C303	1-124-589-11	ELECT	47uF	20%	16V
C304	1-124-465-00	ELECT	0.47uF	20%	50V
C305	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C306	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C307	1-124-261-00	ELECT	10uF	20%	50V
C308	1-126-160-11	ELECT	1uF	20%	50V
C309	1-126-160-11	ELECT	1uF	20%	50V
C310	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C311	1-124-261-00	ELECT	10uF	20%	50V
C312	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C313	1-124-465-00	ELECT	0.47uF	20%	50V
C314	1-124-589-11	ELECT	47uF	20%	16V
C319	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C320	1-124-589-11	ELECT	47uF	20%	16V
C321	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C322	1-124-589-11	ELECT	47uF	20%	16V
C323	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C324	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C325	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C326	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C327	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C328	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C329	1-124-589-11	ELECT	47uF	20%	16V
C330	1-126-163-11	ELECT	4.7uF	20%	50V
C331	1-126-163-11	ELECT	4.7uF	20%	50V
C332	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C333	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C335	1-163-031-11	CERAMIC CHIP	0.01uF		50V

< CONNECTOR >

CN301	1-506-486-11	PIN, CONNECTOR 7P

< DIODE >

D301	8-719-800-76	DIODE	1SS226
D302	8-719-800-76	DIODE	1SS226
D303	8-719-157-33	DIODE	RD6.2M-B
D304	8-719-157-33	DIODE	RD6.2M-B

< FERRITE BEAD >

FB301	1-412-390-21	INDUCTOR CHIP 0uH
FB302	1-412-390-21	INDUCTOR CHIP 0uH
FB303	1-412-390-21	INDUCTOR CHIP 0uH
FB304	1-412-390-21	INDUCTOR CHIP 0uH

< IC >

IC301	8-759-099-06	IC	M5218AFP-TE1
IC302	8-759-634-96	IC	M5207L05
IC303	8-759-099-06	IC	M5218AFP-TE1
IC304	8-759-099-06	IC	M5218AFP-TE1
IC305	8-759-701-51	IC	NJM2072M

MA-711 MB-717

< JACK >

Ref. No.	Part No.	Description	Remarks
J301	1-507-678-00	JACK (CONTROL)	
J302	1-750-990-11	JACK (LARGE TYPE) 2P (MIC)	

< JUMPER RESISTOR >

Ref. No.	Part No.	Description	Remarks
JR301	1-216-295-91	CONDCTOR, CHIP (2012)	
JR302	1-216-295-91	CONDCTOR, CHIP (2012)	
JR303	1-216-295-91	CONDCTOR, CHIP (2012)	

< COIL >

Ref. No.	Part No.	Description	Remarks
L301	1-408-976-21	INDUCTOR 33uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remarks
Q301	8-729-027-31	TRANSISTOR DTA124EKA-T146	

< RESISTOR >

Ref. No.	Part No.	Description				Remarks
R301	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R302	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R303	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R304	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R305	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R306	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R307	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R308	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R309	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R310	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R311	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R312	1-216-033-00	METAL CHIP	220	5%	1/10W	
R313	1-216-033-00	METAL CHIP	220	5%	1/10W	
R314	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R315	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R316	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R317	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R318	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R319	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R320	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R321	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R322	1-208-813-11	METAL GLAZE	20K	0.50%	1/10W	
R323	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R324	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R325	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R326	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R327	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R328	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R329	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R332	1-216-295-91	CONDCTOR, CHIP (2012)				
R333	1-216-295-91	CONDCTOR, CHIP (2012)				
R335	1-216-295-91	CONDCTOR, CHIP (2012)				

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Ref. No.	Part No.	Description	Remarks
*	A-6423-318-A	MB-717 BOARD, COMPLETE	

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(Ref.No.1,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description				Remarks
C001	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C002	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C003	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C004	1-124-443-00	ELECT	100uF	20%	10V	
C005	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C006	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C007	1-126-177-11	ELECT	100uF	20%	10V	
C008	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C009	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C010	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C011	1-124-443-00	ELECT	100uF	20%	10V	
C012	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C013	1-163-099-00	CERAMIC CHIP	18PF	5%	50V	
C014	1-163-249-11	CERAMIC CHIP	82PF	5%	50V	
C015	1-163-099-00	CERAMIC CHIP	18PF	5%	50V	
C016	1-124-903-11	ELECT	1uF	20%	50V	
C017	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C018	1-163-249-11	CERAMIC CHIP	82PF	5%	50V	
C019	1-163-127-00	CERAMIC CHIP	270PF	5%	50V	
C020	1-126-803-11	ELECT	47uF	20%	10V	
C021	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C022	1-163-257-11	CERAMIC CHIP	180PF	5%	50V	
C023	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C024	1-216-119-00	METAL CHIP	820K 5%	1/10W		
C025	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C026	1-163-237-11	CERAMIC CHIP	27PF	5%	50V	
C027	1-124-635-00	ELECT	220uF	20%	6.3V	
C028	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C029	1-163-116-00	CERAMIC CHIP	91PF	5%	50V	
C030	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C032	1-163-241-11	CERAMIC CHIP	39PF	5%	50V	
C033	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	
C034	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C035	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C036	1-163-235-11	CERAMIC CHIP	22PF	5%	50V	
C037	1-163-108-00	CERAMIC CHIP	43PF	5%	50V	
C038	1-163-249-11	CERAMIC CHIP	82PF	5%	50V	
C039	1-163-114-00	CERAMIC CHIP	75PF	5%	50V	
C040	1-124-257-00	ELECT	2.2uF	20%	50V	
C041	1-124-257-00	ELECT	2.2uF	20%	50V	
C042	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C043	1-163-116-00	CERAMIC CHIP	91PF	5%	50V	
C044	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	
C045	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C046	1-124-584-00	ELECT	100uF	20%	10V	

Ref. No.	Part No.	Description			Remarks
C047	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C048	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C049	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C050	1-126-923-11	ELECT	220uF	20%	10V
C051	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C052	1-163-220-11	CERAMIC CHIP	3PF	0.25PF	50V
C053	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C054	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C055	1-124-443-00	ELECT	100uF	20%	10V
C056	1-124-443-00	ELECT	100uF	20%	10V
C057	1-124-907-11	ELECT	10uF	20%	50V
C058	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C059	1-126-803-11	ELECT	47uF	20%	10V
C060	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C061	1-126-803-11	ELECT	47uF	20%	10V
C062	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C063	1-124-443-00	ELECT	100uF	20%	10V
C064	1-126-803-11	ELECT	47uF	20%	10V
C065	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C066	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C067	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C068	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C069	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C071	1-216-295-91	CONDCTOR, CHIP	(2012)		
C072	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C074	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C075	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C076	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C077	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C078	1-124-903-11	ELECT	1uF	20%	50V
C079	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C080	1-124-443-00	ELECT	100uF	20%	10V
C081	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C082	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C083	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C085	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C086	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C088	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C089	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C090	1-126-803-11	ELECT	47uF	20%	10V
C091	1-126-803-11	ELECT	47uF	20%	10V
C092	1-124-589-11	ELECT	47uF	20%	16V
C093	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C094	1-126-803-11	ELECT	47uF	20%	10V
C095	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C096	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C097	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C098	1-124-907-11	ELECT	10uF	20%	50V
C100	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C110	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C111	1-164-346-11	CERAMIC CHIP	1uF		16V
C112	1-124-907-11	ELECT	10uF	20%	50V
C113	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C114	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C115	1-126-803-11	ELECT	47uF	20%	10V
C116	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C118	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C120	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C200	1-124-443-00	ELECT	100uF	20%	10V
C201	1-126-803-11	ELECT	47uF	20%	10V
C202	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C203	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C204	1-126-803-11	ELECT	47uF	20%	10V
C205	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C206	1-124-907-11	ELECT	10uF	20%	50V
C207	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C208	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C209	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C210	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C211	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C212	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C213	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C214	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C215	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C216	1-126-803-11	ELECT	47uF	20%	10V
C217	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C218	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C219	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C220	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C221	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C222	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C223	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C224	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C225	1-163-033-91	CERAMIC CHIP	0.022uF		50V
C226	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C227	1-126-803-11	ELECT	47uF	20%	10V
C228	1-124-443-00	ELECT	100uF	20%	10V
C229	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C230	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C231	1-137-368-11	FILM	0.0047uF	5%	50V
C232	1-137-378-11	FILM	0.22uF	5%	50V
C233	1-137-368-11	FILM	0.0047uF	5%	50V
C234	1-137-378-11	FILM	0.22uF	5%	50V
C235	1-137-442-11	FILM	0.039uF	5%	50V
C236	1-137-442-11	FILM	0.039uF	5%	50V
C237	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C238	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C239	1-137-399-11	FILM	0.1uF	5%	50V
C240	1-126-803-11	ELECT	47uF	20%	10V
C241	1-124-902-00	ELECT	0.47uF	20%	50V

MB-717

Ref. No.	Part No.	Description			Remarks
C242	1-124-907-11	ELECT	10uF	20%	50V
C244	1-126-803-11	ELECT	47uF	20%	10V
C245	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C247	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C249	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C250	1-107-714-11	ELECT	10uF	20%	16V
C251	1-109-889-11	ELECT	1uF	20%	50V
C252	1-126-803-11	ELECT	47uF	20%	10V
C253	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C254	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C257	1-126-916-11	ELECT	1000uF	20%	6.3V
C258	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C259	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C260	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C261	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C263	1-124-927-11	ELECT	4.7uF	20%	100V
C265	1-124-927-11	ELECT	4.7uF	20%	100V
C266	1-124-927-11	ELECT	4.7uF	20%	100V
C268	1-124-927-11	ELECT	4.7uF	20%	100V
C270	1-124-477-11	ELECT	47uF	20%	25V
C271	1-124-927-11	ELECT	4.7uF	20%	100V
C272	1-124-477-11	ELECT	47uF	20%	25V
C273	1-124-927-11	ELECT	4.7uF	20%	100V
C286	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C287	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C288	1-124-477-11	ELECT	47uF	20%	25V
C293	1-126-923-11	ELECT	220uF	20%	10V
C350	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C351	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C401	1-124-589-11	ELECT	47uF	20%	16V
C402	1-124-589-11	ELECT	47uF	20%	16V
C403	1-124-477-11	ELECT	47uF	20%	25V
C404	1-124-477-11	ELECT	47uF	20%	25V
C405	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C406	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C407	1-126-803-11	ELECT	47uF	20%	10V
C408	1-126-803-11	ELECT	47uF	20%	10V
C410	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C411	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C412	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C413	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C414	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C415	1-107-715-11	ELECT	22uF	20%	16V
C416	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C417	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C418	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C419	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C420	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C421	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C423	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C424	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C425	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C427	1-107-714-11	ELECT	10uF	20%	16V
C428	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C430	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C431	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C432	1-163-022-00	CERAMIC CHIP	0.012uF	10%	50V
C433	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C434	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C435	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C436	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C437	1-124-273-00	ELECT	3.3uF	20%	50V
C439	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C440	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C441	1-107-714-11	ELECT	10uF	20%	16V
C443	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C444	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C445	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C447	1-163-019-00	CERAMIC CHIP	6800PF	5%	50V
C448	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C449	1-109-889-11	ELECT	1uF	20%	50V
C450	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C451	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C453	1-124-903-11	ELECT	1uF	20%	50V
C454	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C455	1-163-024-00	CERAMIC CHIP	0.018uF	10%	50V
C456	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C457	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C458	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C459	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C501	1-126-803-11	ELECT	47uF	20%	10V
C502	1-107-701-11	ELECT	47uF	20%	16V
C503	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C504	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C505	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C506	1-124-927-11	ELECT	4.7uF	20%	100V
C507	1-124-768-11	ELECT	4.7uF	20%	35V
C508	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C509	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C510	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C511	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C512	1-124-477-11	ELECT	47uF	20%	25V
C513	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C514	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C515	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C516	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C517	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C519	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C520	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C530	1-163-257-11	CERAMIC CHIP	180PF	5%	50V

Ref. No.	Part No.	Description			Remarks
C654	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C655	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C701	1-124-477-11	ELECT	47uF	20%	25V
C702	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C703	1-126-803-11	ELECT	47uF	20%	10V
C704	1-130-477-00	MYLAR	0.0033uF	5%	50V
C705	1-126-803-11	ELECT	47uF	20%	10V
C706	1-124-589-11	ELECT	47uF	20%	16V
C707	1-130-477-00	MYLAR	0.0033uF	5%	50V
C708	1-130-477-00	MYLAR	0.0033uF	5%	50V
C709	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C710	1-124-927-11	ELECT	4.7uF	20%	100V
C711	1-137-399-11	FILM	0.1uF	5%	50V
C712	1-164-693-11	CERAMIC CHIP	0.0018uF	5%	50V
C713	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C714	1-126-803-11	ELECT	47uF	20%	10V
C715	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C716	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C717	1-124-927-11	ELECT	4.7uF	20%	100V
C718	1-137-399-11	FILM	0.1uF	5%	50V
C719	1-164-693-11	CERAMIC CHIP	0.0018uF	5%	50V
C720	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C721	1-163-143-00	CERAMIC CHIP	0.0012uF	5%	50V
C722	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C723	1-124-927-11	ELECT	4.7uF	20%	100V
C724	1-137-399-11	FILM	0.1uF	5%	50V
C725	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C726	1-163-012-00	CERAMIC CHIP	0.0018uF	10%	50V
C727	1-124-589-11	ELECT	47uF	20%	16V
C728	1-107-701-11	ELECT	47uF	20%	16V
C729	1-107-701-11	ELECT	47uF	20%	16V
C730	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C731	1-163-087-00	CERAMIC CHIP	4PF		50V
C732	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C733	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C734	1-126-163-11	ELECT	4.7uF	20%	50V
C735	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C736	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C737	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C738	1-126-803-11	ELECT	47uF	20%	10V
C739	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C741	1-163-038-91	CERAMIC CHIP	0.1uF		25V

< CONNECTOR >

Ref. No.	Part No.	Description	Remarks
CN001	1-695-342-31	PIN, CONNECTOR (PC BOARD) 19P	
CN401	1-750-687-11	HOUSING, CONNECTOR (PC BOARD)	
* CN402	1-764-594-21	CONNECTOR, FPC 18P	
CN403	1-695-335-11	PIN, CONNECTOR (PC BOARD) 12P	
CN501	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P	
CN502	1-695-346-21	PIN, CONNECTOR (PC BOARD) 23P	
* CN701	1-564-005-11	PIN, CONNECTOR 6P	
CN702	1-506-472-11	PIN, CONNECTOR 7P	

< TRIMMER >

Ref. No.	Part No.	Description	Remarks
CT001	1-141-318-11	CAP, VAR, TRIMMER	

< DIODE >

Ref. No.	Part No.	Description		Remarks
D001	8-719-987-69	DIODE	DAN217	
D002	8-719-988-62	DIODE	1SS355	
D110	8-719-988-62	DIODE	1SS355	
D202	8-719-914-43	DIODE	DAN202K-T-146	
D203	8-719-032-80	DIODE	KV1430TL00	
D204	8-719-914-42	DIODE	DA204K-T-146	
D205	8-719-914-42	DIODE	DA204K-T-146	
D206	8-719-988-62	DIODE	1SS355	
D209	8-719-988-62	DIODE	1SS355	
D401	8-719-988-62	DIODE	1SS355	
D402	8-719-914-42	DIODE	DA204K-T-146	
D403	8-719-914-43	DIODE	DAN202K-T-146	
D404	8-719-914-44	DIODE	DAP202K	
D405	8-719-976-94	DIODE	DTZ4.7A	
D501	8-719-988-62	DIODE	1SS355	
D503	8-719-988-62	DIODE	1SS355	
D504	8-719-977-34	DIODE	DTZ12	
D505	8-719-914-44	DIODE	DAP202K	
D701	8-719-914-42	DIODE	DA204K-T-146	
D702	8-719-976-91	DIODE	DTZ4.3B	
D703	8-719-976-91	DIODE	DTZ4.3B	
D704	8-719-914-42	DIODE	DA204K-T-146	
D705	8-719-914-42	DIODE	DA204K-T-146	
D706	8-719-988-62	DIODE	1SS355	

< FERRITE BEAD >

Ref. No.	Part No.	Description	Remarks
FB501	1-414-135-11	INDUCTOR CHIP 0UH	

< FILTER >

Ref. No.	Part No.	Description	Remarks
FL001	1-577-543-11	FILTER, CERAMIC	
FL002	1-577-543-11	FILTER, CERAMIC	
FL201	1-236-744-21	FILTER, EMI	
FL202	1-236-744-21	FILTER, EMI	
FL701	1-424-031-11	FILTER, NOISE	

< IC >

Ref. No.	Part No.	Description		Remarks
IC001	8-759-299-92	IC	AN2661NK	
IC002	8-759-327-20	IC	M35012-098SP	
IC003	8-759-290-65	IC	MN8811	
IC004	8-759-295-66	IC	BA7653AF-E2	
IC005	8-759-324-99	IC	MM1118XFBE	

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Ref. No.	Part No.	Description	Remarks
IC201	8-752-372-94	IC CXD2507AQ	
IC203	8-759-253-26	IC CA0002AM-TP	
IC204	8-759-700-43	IC NJM4558M	
IC205	8-759-327-78	IC TC9404FN-EL	
IC206	8-759-700-43	IC NJM4558M	
IC401	8-759-280-89	IC HA11529F	
⚠IC402	8-759-822-38	IC LA6510	
⚠IC403	8-759-700-43	IC NJM4558M	
IC404	8-759-700-43	IC NJM4558M	
IC405	8-759-700-43	IC NJM4558M	
IC406	8-759-700-43	IC NJM4558M	
IC407	8-759-300-71	IC HD14053BFP	
IC501	8-759-336-58	IC MB89094PF-G-139-BND	
IC502	8-759-329-96	IC MSM10S0110-069GS-V1K	
IC503	8-759-231-92	IC TA7291P	
IC504	8-759-058-50	IC XRA10324AF-E2	
IC505	8-759-009-06	IC MC14052BF	
IC506	8-759-300-71	IC HD14053BFP	
IC701	8-759-604-35	IC M5F78M05	
IC702	8-759-300-71	IC HD14053BFP	
IC703	8-759-258-80	IC YSS216B-F	
IC704	8-759-177-12	IC MSM51C464A-80RS	
IC705	8-759-700-43	IC NJM4558M	
IC706	8-759-700-43	IC NJM4558M	
IC707	8-759-700-43	IC NJM4558M	

< JACK >

Ref. No.	Part No.	Description	Remarks
J202	1-764-592-11	JACK 3P (LINE OUT2)	
J203	1-764-592-11	JACK 3P (LINE OUT1)	

< JUMPER RESISTOR >

Ref. No.	Part No.	Description	Remarks
JR006	1-216-295-91	CONDCTOR, CHIP (2012)	
JR007	1-216-295-91	CONDCTOR, CHIP (2012)	
JR402	1-216-295-91	CONDCTOR, CHIP (2012)	
JR403	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR404	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR405	1-216-295-91	CONDCTOR, CHIP (2012)	
JR601	1-216-295-91	CONDCTOR, CHIP (2012)	
JR602	1-216-295-91	CONDCTOR, CHIP (2012)	

< COIL >

Ref. No.	Part No.	Description	Remarks
L001	1-408-970-21	INDUCTOR 10uH	
L002	1-408-970-21	INDUCTOR 10uH	
L003	1-408-970-21	INDUCTOR 10uH	
L004	1-408-970-21	INDUCTOR 10uH	
L005	1-408-973-21	INDUCTOR 18uH	
L006	1-410-381-11	INDUCTOR CHIP 10uH	
L007	1-408-974-21	INDUCTOR 22uH	
L008	1-410-512-61	INDUCTOR 18uH	
L009	1-410-512-61	INDUCTOR 18uH	
L010	1-410-507-11	INDUCTOR 6.8uH	
L011	1-410-507-11	INDUCTOR 6.8uH	
L012	1-408-974-21	INDUCTOR 22uH	
L013	1-408-976-21	INDUCTOR 33uH	
L014	1-408-976-21	INDUCTOR 33uH	
L015	1-408-975-21	INDUCTOR 27uH	
L016	1-408-970-21	INDUCTOR 10uH	
L017	1-408-975-21	INDUCTOR 27uH	
L018	1-408-970-21	INDUCTOR 10uH	
L019	1-408-970-21	INDUCTOR 10uH	
L020	1-408-970-21	INDUCTOR 10uH	
L021	1-408-970-21	INDUCTOR 10uH	
L022	1-408-974-21	INDUCTOR 22uH	
L024	1-408-974-21	INDUCTOR 22uH	
L025	1-408-970-21	INDUCTOR 10uH	
L026	1-408-975-21	INDUCTOR 27uH	
L027	1-408-970-21	INDUCTOR 10uH	
L028	1-408-970-21	INDUCTOR 10uH	
L201	1-408-982-21	INDUCTOR 100uH	
L202	1-408-979-21	INDUCTOR 56uH	
L203	1-408-978-21	INDUCTOR 47uH	
L204	1-408-973-21	INDUCTOR 18uH	
L205	1-408-985-21	INDUCTOR 180uH	
L209	1-414-161-21	INDUCTOR 1mH	
L210	1-414-161-21	INDUCTOR 1mH	
L401	1-408-970-21	INDUCTOR 10uH	
L402	1-408-970-21	INDUCTOR 10uH	
L404	1-408-983-21	INDUCTOR 120uH	
L405	1-408-983-21	INDUCTOR 120uH	
L406	1-408-970-21	INDUCTOR 10uH	
L407	1-408-970-21	INDUCTOR 10uH	
L501	1-408-970-21	INDUCTOR 10uH	
L504	1-408-970-21	INDUCTOR 10uH	
L701	1-408-958-21	INDUCTOR 1uH	
L702	1-408-958-21	INDUCTOR 1uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remarks
Q001	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q002	8-729-027-43	TRANSISTOR DTC114EKA-T146	
Q003	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q004	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q007	8-729-120-28	TRANSISTOR 2SC1623-L5L6	

Note:	**Note:**
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description	Remarks
Q009	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q011	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q012	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q013	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q014	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q015	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q016	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q017	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q019	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q020	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q021	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q022	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q023	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q024	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q025	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q026	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q027	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q028	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q030	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q201	8-729-027-43	TRANSISTOR DTC114EKA-T146	
Q202	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q203	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q204	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q205	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q206	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q207	8-729-027-44	TRANSISTOR DTC114TKA-T146	
Q208	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q209	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q210	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q211	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q214	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q215	8-729-202-38	TRANSISTOR 2SC3326N-A	
⚠Q401	8-729-019-01	TRANSISTOR 2SD2394-EF	
⚠Q402	8-729-024-95	TRANSISTOR 2SB1565EF	
⚠Q403	8-729-019-01	TRANSISTOR 2SD2394-EF	
⚠Q404	8-729-024-95	TRANSISTOR 2SB1565EF	
Q405	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q406	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q407	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q408	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q409	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q410	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q411	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q412	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q413	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q414	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q415	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q416	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q417	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q418	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q501	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q502	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q614	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q702	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q703	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q704	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q705	8-729-027-52	TRANSISTOR DTC124EKA-T146	
		< RESISTOR >	
R001	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R002	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R003	1-216-041-00	METAL CHIP 470 5% 1/10W	
R004	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R005	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R006	1-216-021-00	METAL CHIP 68 5% 1/10W	
R007	1-216-035-00	METAL CHIP 270 5% 1/10W	
R008	1-216-047-00	METAL CHIP 820 5% 1/10W	
R009	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R010	1-216-037-00	METAL CHIP 330 5% 1/10W	
R011	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R012	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R014	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R015	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R016	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R017	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R018	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R019	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R020	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R021	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R022	1-216-041-00	METAL CHIP 470 5% 1/10W	
R023	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R025	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R027	1-216-119-00	METAL CHIP 820K 5% 1/10W	
R032	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R033	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R034	1-216-045-00	METAL CHIP 680 5% 1/10W	
R035	1-216-039-00	METAL CHIP 390 5% 1/10W	
R036	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R038	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R039	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	
R040	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R041	1-216-009-00	METAL CHIP 22 5% 1/10W	
R042	1-216-029-00	METAL CHIP 150 5% 1/10W	
R043	1-216-041-00	METAL CHIP 470 5% 1/10W	
R044	1-216-041-00	METAL CHIP 470 5% 1/10W	
R045	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R046	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R047	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	

Note:	**Note:**
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Ref. No.	Part No.	Description				Remarks
R048	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R049	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R050	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R051	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R052	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R053	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R054	1-216-041-00	METAL CHIP	470	5%	1/10W	
R055	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R056	1-216-039-00	METAL CHIP	390	5%	1/10W	
R059	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R061	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R062	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R063	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R064	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R065	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R066	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R067	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R068	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R069	1-216-037-00	METAL CHIP	330	5%	1/10W	
R070	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R071	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R072	1-216-033-00	METAL CHIP	220	5%	1/10W	
R073	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R074	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R075	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R076	1-216-295-91	CONDCTOR, CHIP	(2012)			
R077	1-216-041-00	METAL CHIP	470	5%	1/10W	
R078	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R079	1-216-041-00	METAL CHIP	470	5%	1/10W	
R080	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R081	1-216-021-00	METAL CHIP	68	5%	1/10W	
R082	1-216-041-00	METAL CHIP	470	5%	1/10W	
R083	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R084	1-216-041-00	METAL CHIP	470	5%	1/10W	
R085	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R086	1-216-021-00	METAL CHIP	68	5%	1/10W	
R088	1-216-295-91	CONDCTOR, CHIP	(2012)			
R089	1-216-033-00	METAL CHIP	220	5%	1/10W	
R090	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R091	1-216-058-00	METAL GLAZE	2.4K	5%	1/10W	
R093	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R094	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R095	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R097	1-216-295-91	CONDCTOR, CHIP	(2012)			
R098	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R099	1-216-037-00	METAL CHIP	330	5%	1/10W	
R110	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R111	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R112	1-216-295-91	CONDCTOR, CHIP	(2012)			
R113	1-216-037-00	METAL CHIP	330	5%	1/10W	
R119	1-216-047-00	METAL CHIP	820	5%	1/10W	

Ref. No.	Part No.	Description				Remarks
R120	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R121	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R122	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R123	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R124	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R125	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R126	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R127	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R128	1-216-029-00	METAL CHIP	150	5%	1/10W	
R129	1-216-033-00	METAL CHIP	220	5%	1/10W	
R130	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R139	1-164-232-11	CERAMIC CHIP	0.01uF			50V
R143	1-216-295-91	CONDCTOR, CHIP	(2012)			
R144	1-216-033-00	METAL CHIP	220	5%	1/10W	
R145	1-216-295-91	CONDCTOR, CHIP	(2012)			
R201	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R203	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R206	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R208	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R209	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R210	1-216-041-00	METAL CHIP	470	5%	1/10W	
R211	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R212	1-216-017-00	METAL CHIP	47	5%	1/10W	
R213	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R214	1-216-023-00	METAL CHIP	82	5%	1/10W	
R215	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R216	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R217	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R218	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R219	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R220	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R224	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R226	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R227	1-216-074-00	METAL CHIP	11K	5%	1/10W	
R228	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R229	1-163-031-11	CERAMIC CHIP	0.01MF			50V
R235	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R236	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R237	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R238	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R239	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R240	1-216-096-00	METAL GLAZE	91K	5%	1/10W	
R241	1-216-295-91	CONDCTOR, CHIP	(2012)			
R242	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R243	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R244	1-216-295-91	CONDCTOR, CHIP	(2012)			
R245	1-216-104-00	METAL CHIP	200K	5%	1/10W	
R246	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R249	1-216-295-91	CONDCTOR, CHIP	(2012)			
R250	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	

Ref. No.	Part No.	Description				Remarks
R251	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R252	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R253	1-216-295-91	CONDCTOR, CHIP	(2012)			
R254	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R255	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R256	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R257	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R258	1-216-104-00	METAL CHIP	200K	5%	1/10W	
R259	1-216-295-91	CONDCTOR, CHIP	(2012)			
R260	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R261	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R262	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R263	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R264	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R265	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R266	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R267	1-216-295-91	CONDCTOR, CHIP	(2012)			
R269	1-216-295-91	CONDCTOR, CHIP	(2012)			
R270	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R271	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R272	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R273	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R274	1-216-295-91	CONDCTOR, CHIP	(2012)			
R275	1-216-295-91	CONDCTOR, CHIP	(2012)			
R276	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R277	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R278	1-216-295-91	CONDCTOR, CHIP	(2012)			
R279	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R280	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R281	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R283	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R284	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R285	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R286	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R289	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R290	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R291	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R292	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R293	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R294	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R295	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R296	1-216-035-00	METAL CHIP	270	5%	1/10W	
R297	1-216-035-00	METAL CHIP	270	5%	1/10W	
R298	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R299	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R300	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R301	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R302	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R303	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R307	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	

Ref. No.	Part No.	Description				Remarks
R308	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R309	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R311	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R320	1-216-295-91	CONDCTOR, CHIP	(2012)			
R321	1-216-295-91	CONDCTOR, CHIP	(2012)			
R322	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R323	1-216-033-00	METAL CHIP	220	5%	1/10W	
R324	1-216-033-00	METAL CHIP	220	5%	1/10W	
R352	1-216-037-00	METAL CHIP	330	5%	1/10W	
R353	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R354	1-216-295-91	CONDCTOR, CHIP	(2012)			
R401	1-216-369-00	METAL OXIDE	1	5%	2W	F
R402	1-216-146-00	METAL GLAZE	6.8	5%	1/8W	
R403	1-216-146-00	METAL GLAZE	6.8	5%	1/8W	
R404	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R405	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R406	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R407	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R408	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R409	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R411	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R412	1-216-045-00	METAL CHIP	680	5%	1/10W	
R413	1-216-047-00	METAL CHIP	820	5%	1/10W	
R414	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R415	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R416	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R417	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R418	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R419	1-216-045-00	METAL CHIP	680	5%	1/10W	
R420	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R421	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R422	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R423	1-216-039-00	METAL CHIP	390	5%	1/10W	
R424	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R425	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R426	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R427	1-216-017-00	METAL CHIP	47	5%	1/10W	
R428	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R429	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R430	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R431	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R432	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R433	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R434	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R435	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R436	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R437	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R438	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R442	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R444	1-216-075-00	METAL CHIP	12K	5%	1/10W	

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Ref. No.	Part No.	Description				Remarks
R445	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R446	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R447	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R448	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R449	1-216-035-00	METAL CHIP	270	5%	1/10W	
R450	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R451	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R452	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R453	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R454	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R455	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R456	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R457	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R458	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R459	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R460	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R461	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R462	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R463	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R464	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R465	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R466	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R467	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R468	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R469	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R470	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R471	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R472	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R473	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R474	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R475	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R476	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R477	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R478	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R479	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R480	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R481	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R482	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R483	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R484	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R485	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R486	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R487	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R488	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R489	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R490	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R491	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R492	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R493	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R494	1-216-105-91	METAL GLAZE	220K	5%	1/10W	

Ref. No.	Part No.	Description				Remarks
R495	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R496	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R497	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R498	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R499	1-216-090-00	METAL CHIP	51K	5%	1/10W	
R502	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R506	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R507	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R508	1-208-816-11	METAL GLAZE	27K	0.50%	1/10W	
R509	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W	
R510	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R511	1-216-111-00	METAL CHIP	390K	5%	1/10W	
R512	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R513	1-208-838-11	METAL GLAZE	220K	0.50%	1/10W	
R514	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W	
R515	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R516	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R517	1-208-808-11	METAL GLAZE	12K	0.50%	1/10W	
R518	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W	
R519	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W	
R520	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R521	1-208-844-11	METAL GLAZE	390K	0.50%	1/10W	
R522	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R523	1-216-035-00	METAL CHIP	270	5%	1/10W	
R524	1-208-810-11	METAL GLAZE	15K	0.50%	1/10W	
R525	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R526	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R527	1-216-033-00	METAL CHIP	220	5%	1/10W	
R528	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R530	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R531	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R532	1-216-045-00	METAL CHIP	680	5%	1/10W	
R533	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R534	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R535	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R536	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R537	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R538	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R539	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R540	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R541	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R542	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R543	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
⚠R544	1-212-950-00	FUSIBLE	4.7	5%	1/2W	F
R545	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R546	1-216-045-00	METAL CHIP	680	5%	1/10W	
R547	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	

Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description			Remarks
R548	1-216-081-00	METAL CHIP	22K	5%	1/10W
R549	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R550	1-216-073-00	METAL CHIP	10K	5%	1/10W
R551	1-216-081-00	METAL CHIP	22K	5%	1/10W
R552	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R555	1-216-021-00	METAL CHIP	68	5%	1/10W
R556	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R557	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R558	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R559	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R560	1-216-033-00	METAL CHIP	220	5%	1/10W
R561	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R562	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R563	1-216-033-00	METAL CHIP	220	5%	1/10W
R564	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R566	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R567	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R568	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R569	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R570	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R571	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R572	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R573	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R574	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R576	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R577	1-216-073-00	METAL CHIP	10K	5%	1/10W
R578	1-216-089-00	METAL CHIP	47K	5%	1/10W
R594	1-216-295-91	CONDCTOR, CHIP	(2012)		
R595	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R596	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R597	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R598	1-216-295-91	CONDCTOR, CHIP	(2012)		
R663	1-216-025-91	METAL GLAZE	100	5%	1/10W
R677	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R689	1-216-295-91	CONDCTOR, CHIP	(2012)		
R702	1-216-025-91	METAL GLAZE	100	5%	1/10W
R703	1-216-073-00	METAL CHIP	10K	5%	1/10W
R704	1-216-295-91	CONDCTOR, CHIP	(2012)		
R705	1-216-097-00	METAL CHIP	100K	5%	1/10W
R706	1-216-097-00	METAL CHIP	100K	5%	1/10W
R707	1-216-097-00	METAL CHIP	100K	5%	1/10W
R708	1-216-073-00	METAL CHIP	10K	5%	1/10W
R710	1-216-295-91	CONDCTOR, CHIP	(2012)		
R711	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R712	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R713	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R715	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R717	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R718	1-216-067-00	METAL CHIP	5.6K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R719	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R721	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R722	1-208-815-11	METAL GLAZE	24K	0.50%	1/10W
R723	1-216-121-00	METAL CHIP	1M	5%	1/10W
R725	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R726	1-216-073-00	METAL CHIP	10K	5%	1/10W
R727	1-216-073-00	METAL CHIP	10K	5%	1/10W
R728	1-216-295-91	CONDCTOR, CHIP	(2012)		
R729	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R730	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R731	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R732	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R733	1-216-121-00	METAL CHIP	1M	5%	1/10W
R734	1-216-073-00	METAL CHIP	10K	5%	1/10W
R735	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R736	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R737	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R738	1-216-073-00	METAL CHIP	10K	5%	1/10W
R739	1-216-085-00	METAL CHIP	33K	5%	1/10W
R740	1-216-025-91	METAL GLAZE	100	5%	1/10W
R741	1-216-025-91	METAL GLAZE	100	5%	1/10W
R742	1-216-025-91	METAL GLAZE	100	5%	1/10W
R743	1-216-025-91	METAL GLAZE	100	5%	1/10W
R744	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R746	1-216-295-91	CONDCTOR, CHIP	(2012)		
R747	1-216-073-00	METAL CHIP	10K	5%	1/10W
R900	1-216-085-00	METAL CHIP	33K	5%	1/10W
R901	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R902	1-216-081-00	METAL CHIP	22K	5%	1/10W
R903	1-216-081-00	METAL CHIP	22K	5%	1/10W
R904	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R905	1-216-085-00	METAL CHIP	33K	5%	1/10W
R906	1-216-077-00	METAL CHIP	15K	5%	1/10W
R907	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R908	1-216-097-00	METAL CHIP	100K	5%	1/10W
R910	1-216-295-91	CONDCTOR, CHIP	(2012)		
R911	1-216-081-00	METAL CHIP	22K	5%	1/10W
R912	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R913	1-216-103-91	METAL GLAZE	180K	5%	1/10W
R914	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R915	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R916	1-216-083-00	METAL CHIP	27K	5%	1/10W
R917	1-216-099-00	METAL CHIP	120K	5%	1/10W
R918	1-216-103-91	METAL CHIP	180K	5%	1/10W
R919	1-216-073-00	METAL CHIP	10K	5%	1/10W
R920	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R921	1-216-103-91	METAL CHIP	180K	5%	1/10W
R922	1-216-073-00	METAL CHIP	10K	5%	1/10W
R923	1-216-061-00	METAL CHIP	3.3K	5%	1/10W

Ref. No.	Part No.	Description	Remarks
R924	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R925	1-216-017-00	METAL CHIP 47 5% 1/10W	
R926	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R927	1-216-003-11	METAL GLAZE 12 5% 1/10W	
R928	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R929	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R930	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R931	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R932	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R933	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R935	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R936	1-216-031-00	METAL CHIP 180 5% 1/10W	
R937	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R939	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R944	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R945	1-216-049-91	METAL GLAZE 1K 5% 1/10W	

< VARIABLE RESISTOR >

RV001	1-223-236-11	RES, ADJ, CARBON 1K	
RV401	1-223-241-11	RES, ADJ, CARBON 47K	
RV402	1-223-241-11	RES, ADJ, CARBON 47K	

< SWITCH >

S201	1-553-725-21	SWITCH, SLIDE (ATT)	

< VIBRATOR >

X001	1-760-693-21	VIBRATOR, CRYSTAL 28.12MHz	
X201	1-567-515-11	VIBRATOR, VARIABLE CRYSTAL 16.93MHz	

****

* A-6423-230-A MD-705 BOARD, COMPLETE

****

(Ref.No.2,000 Series)

	3-953-262-01	HOLDER, LED	

< CONNECTOR >

CN431	1-695-335-11	PIN, CONNECTOR (PC BOARD) 12P	
CN432	1-691-036-21	HOUSING, CONNECTOR 4P	
CN433	1-766-938-11	CONNECTOR, BOARD TO BOARD 5P	
* CN434	1-564-014-51	PIN, CONNECTOR 4P	

< DIODE >

D431	8-719-912-39	LED SLR-932A	

< JUMPER RESISTOR >

JR431	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR432	1-216-295-91	CONDCTOR, CHIP (2012)	
JR433	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR434	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR435	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR436	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR437	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR438	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR439	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR440	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR441	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR442	1-216-295-91	CONDCTOR, CHIP (2012)	

< PHOTO INTERUPTER >

PH431	8-729-020-74	DIODE GP1S24	
PH432	8-729-020-74	DIODE GP1S24	

< RESISTOR >

R431	1-216-039-00	METAL CHIP 390 5% 1/10W	
R432	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R433	1-216-248-00	METAL GLAZE 120K 5% 1/8W	
R436	1-216-295-91	CONDCTOR, CHIP (2012)	

< SWITCH >

S431	1-692-440-11	SWITCH, PUSH	

****

* A-6423-229-A MT-706 BOARD, COMPLETE

****

(Ref.No.2,000 Series)

< CONNECTOR >

CN421	1-766-937-11	CONNECTOR, BOARD TO BOARD 5P	

****

MT-707 BOARD, COMPLETE

****

(Ref.No.4,000 Series)

*	1-654-464-11	MT-707 BOARD	

< CAPACITOR >

C481	1-163-038-91	CERAMIC CHIP 0.1uF	25V

< CONNECTOR >

* CN481	1-569-666-11	PIN, CONNECTOR (PC BOARD) 5P	
CN482	1-695-368-31	PIN, CONNECTOR (PC BOARD) 7P	

****

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
	1-413-989-21	POWER BLOCK (A660K) ***********	
	1-468-020-11	POWER BLOCK (K50) ***********	
			(Ref.No.5,000 Series)
⚠	1-533-223-11	HOLDER, FUSE	

< CAPACITOR >

Ref. No.	Part No.	Description	Remarks
C051	1-163-009-11	MULTILAYER CERAMIC 1000PF	50V
C052	1-163-019-11	MULTILAYER CERAMIC 6800PF	50V
C053	1-163-035-11	MULTILAYER CERAMIC 0.047uF	50V
C054	1-163-009-11	MULTILAYER CERAMIC 1000PF	50V
C055	1-163-009-11	MULTILAYER CERAMIC 1000PF	50V
C056	1-163-007-11	MULTILAYER CERAMIC 680PF	50V
C057	1-163-035-11	MULTILAYER CERAMIC 0.047uF	50V
C058	1-163-035-11	MULTILAYER CERAMIC 0.047uF	50V
C059	1-163-017-11	MULTILAYER CERAMIC 4700PF	50V
C060	1-163-007-11	MULTILAYER CERAMIC 680PF	50V
C061	1-163-017-11	MULTILAYER CERAMIC 4700PF	50V
C062	1-163-009-11	MULTILAYER CERAMIC 1000PF	50V
C063	1-124-122-11	ALUMINUM ELECTRIC 100uF	50V
C064	1-130-491-51	FILM 0.047uF	50V
⚠C101	9-902-038-01	METALLIZED 0.22uF	250V
⚠C102	9-900-521-01	METALLIZED 0.1uF	250V
⚠C103	9-900-522-01	CERAMIC 2200PF	400V
⚠C104	9-900-522-01	CERAMIC 2200PF	400V
⚠C105	9-900-522-01	CERAMIC 2200PF	400V (A660K)
⚠C106	9-900-522-01	CERAMIC 2200PF	400V (A660K)
⚠C107	9-900-522-01	CERAMIC 2200PF	400V
⚠C108	9-909-672-01	ALUMINUM ELECTIC 150uF	400V (A660K)
⚠C108	9-900-523-01	ALUMINUM ELECTIC 220uF	200V (K50)
⚠C109	9-909-672-01	ALUMINUM ELECTIC 150uF	400V (A660K)
⚠C110	9-909-673-01	CERAMIC 220PF	1kV (A660K)
⚠C110	9-933-752-01	CERAMIC 470PF	1kV (K50)
⚠C111	9-900-525-01	METALLIZED 0.047uF	400V
⚠C112	1-106-363-00	FILM 0.0068uF	50V
⚠C113	1-130-483-91	METAILLIZED 0.01uF	50V (A660K)
⚠C113	1-130-491-51	METAILLIZED 0.047uF	50V (K50)
⚠C114	1-107-355-51	METALLIZED 0.22uF	50V
⚠C115	1-130-470-00	FILM 820PF	50V
⚠C116	1-216-967-51	ALUMINUM ELECTRIC 47uF	50V
⚠C117	9-900-522-01	CERAMIC 2200PF	400V (A660K)
⚠C118	9-900-522-01	CERAMIC 2200PF	400V (A660K)
⚠C119	9-909-673-01	CERAMIC 220PF	1kV (K50)
⚠C201	1-124-525-11	ALUMINUM ELECTRIC 1000uF	25V
⚠C202	1-124-525-11	ALUMINUM ELECTRIC 1000uF	25V
⚠C203	1-124-760-11	ALUMINUM ELECTRIC 2200uF	10V
⚠C204	1-126-926-11	ALUMINUM ELECTRIC 1000uF	10V
⚠C205	1-126-926-11	ALUMINUM ELECTRIC 1000uF	10V
⚠C206	1-126-925-51	ALUMINUM ELECTRIC 470uF	10V
C208	1-126-964-51	ALUMINUM ELECTRIC 10uF	50V
C210	1-126-964-51	ALUMINUM ELECTRIC 10uF	50V
C211	1-126-925-51	ALUMINUM ELECTRIC 470uF	10V
C212	1-126-923-51	ALUMINUM ELECTRIC 220uF	10V
C213	1-130-495-91	ALUMINUM ELECTRIC 4.7uF	50V
C214	1-124-463-11	ALUMINUM ELECTRIC 0.1uF	50V
C215	9-909-680-01	CERAMIC 1000PF	1kV
C216	9-909-680-01	CERAMIC 1000PF	1kV
C217	1-130-491-51	FILM 0.047uF	50V
C218	1-126-942-11	ALUMINUM ELECTRIC 1000uF	25V
C219	1-126-942-11	ALUMINUM ELECTRIC 1000uF	25V
C220	1-130-467-11	FILM 470PF	50V
C221	1-130-467-11	FILM 470PF	50V

< CONNECTOR >

Ref. No.	Part No.	Description	Remarks
CN051	1-695-342-11	CONNECTOR 19P	
CN052	1-506-473-11	CONNECTOR 8P	
CN053	1-564-506-11	CONNECTOR 3P	
CN101	1-564-419-11	CONNECTOR 2P	

< DIODE >

Ref. No.	Part No.	Description	Remarks
D051	9-902-064-01	DIODE ERA81-004	
D052	9-902-064-01	DIODE ERA81-004	
D053	8-719-200-82	DIODE 11ES2	
D054	8-719-200-82	DIODE 11ES2	
D055	8-719-911-19	DIODE 1SS119	
D056	8-719-911-19	DIODE 1SS119	
D057	8-719-911-19	DIODE 1SS119	
D060	8-719-911-19	DIODE 1SS119	
⚠D101	8-719-510-19	BRIDGE DIODE D2SBA60	
⚠D102	9-902-050-01	DIODE ERA15-06	
⚠D103	8-719-030-25	DIODE EG01C (A660K)	
⚠D103	9-900-512-01	DIODE AG01A (K50)	
⚠D104	9-900-514-01	DIODE MA165	
⚠D105	9-900-535-01	DIODE AU02Z	
⚠D201	8-719-510-72	DIODE S3L20U	
⚠D202	8-719-510-72	DIODE S3L20U	
⚠D203	8-719-510-72	DIODE S3L20U	
⚠D204	8-719-043-74	DIODE AK04	
⚠D205	9-900-514-01	DIODE MA165	
⚠D206	9-900-514-01	DIODE MA165	
⚠D208	8-719-200-82	DIODE 11ES2	
⚠D209	8-719-035-04	ZENNER DIODE MA4240	

Note:	**Note:**
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
		< FUSE >	
⚠F101	1-532-286-11	FUSE TIME LUG (3.15A 250V)	(A660K)
⚠F101	1-532-745-11	FUSE TIME LUG (3.15A 125V)	(K50)
		< IC >	
IC051	8-759-982-73	IC BA10393F	
IC052	8-759-100-96	IC NJM4558M	
⚠IC101	8-759-062-58	IC FA5311S	
⚠IC201	8-759-701-79	IC NJM78M12FA	
⚠IC202	8-759-929-65	IC LM7912CT	
⚠IC203	9-900-532-01	IC AN1431T	
⚠IC204	8-759-100-96	IC NJM4558M	
		< COIL >	
L051	1-424-219-11	CHORKE COIL 300uH	
⚠L101	9-909-675-01	LINE FILTER	
⚠L102	9-909-675-01	LINE FILTER	(A660K)
⚠L103	9-904-796-01	BEAD CORE	
⚠L201	9-909-681-01	CHORKE COIL 10uH	
⚠L202	9-909-681-01	CHORKE COIL 10uH	
⚠L204	9-909-681-01	CHORKE COIL 10uH	
⚠L205	9-909-681-01	CHORKE COIL 10uH	
		< PHOTO COUPLER >	
⚠PC101	9-909-676-01	PHOTO COUPLER	(A660K)
⚠PC101	9-900-519-01	PHOTO COUPLER	(K50)
⚠PC102	9-909-676-01	PHOTO COUPLER	(A660K)
⚠PC102	9-900-519-01	PHOTO COUPLER	(K50)
		< IC LINK >	
⚠PS051	1-532-675-91	IC LINK (ICP-N38 1.5A)	
⚠PS052	1-532-675-91	IC LINK	
		< TRANSISTOR >	
⚠Q051	8-729-117-11	TRANSISTOR 2SB1151	
⚠Q052	8-729-019-31	TRANSISTOR 2SC4596	
⚠Q053	8-729-117-11	TRANSISTOR 2SB1151	
⚠Q054	8-729-019-31	TRANSISTOR 2SC4596	
Q055	8-729-119-78	TRANSISTOR 2SC3311	
Q056	8-729-230-46	TRANSISTOR 2SA1162	
Q058	8-729-230-49	TRANSISTOR 2SC2712	
Q059	8-729-230-46	TRANSISTOR 2SA1162	
Q060	8-729-230-49	TRANSISTOR 2SC2712	
Q061	8-729-119-76	TRANSISTOR 2SA1309	
⚠Q101	9-909-669-01	TRANSISTOR 2SK1547	(A660K)
⚠Q101	9-933-750-01	TRANSISTOR 2SK1102	(K50)
⚠Q201	8-729-021-99	TRANSISTOR 2SB1416	
⚠Q202	8-729-119-78	TRANSISTOR 2SC1740	
⚠Q203	8-729-119-76	TRANSISTOR 2SA933	

Ref. No.	Part No.	Description	Remarks
⚠Q204	9-909-678-01	TRANSISTOR 2SC4545	
⚠Q206	8-729-900-80	TRANSISTOR UN4211	
		< RESISTOR >	
R050	1-216-097-11	THICK FILM 100K 1/10W	
R051	1-216-081-11	THICK FILM 22K 1/10W	
R052	1-216-075-11	THICK FILM 12K 1/10W	
R053	1-216-093-11	THICK FILM 68K 1/10W	
R054	1-216-105-11	THICK FILM 220K 1/10W	
R055	1-216-091-11	THICK FILM 56K 1/10W	
R057	1-216-093-11	THICK FILM 68K 1/10W	
R061	1-216-089-11	THICK FILM 47K 1/10W	
R062	1-216-065-11	THICK FILM 4.7K 1/10W	
R063	1-216-049-11	THICK FILM 1K 1/10W	
R064	1-247-750-11	CARBON 680 5% 1/2W	
R065	1-247-750-11	CARBON 680 5% 1/2W	
R066	1-216-049-11	THICK FILM 1K 1/10W	
⚠R067	1-216-369-51	CARBON 1 2W	
R068	1-219-387-11	THICK FILM 43K 0.1% 1/10W	
R069	1-219-391-11	THICK FILM 47K 0.1% 1/10W	
R070	1-219-387-11	THICK FILM 43K 0.1% 1/10W	
R071	1-219-391-11	THICK FILM 47K 0.1% 1/10W	
R072	1-216-073-11	THICK FILM 10K 1/10W	
R073	1-216-073-11	THICK FILM 10K 1/10W	
⚠R074	1-215-866-11	CARBON 330 5% 1W	
R075	1-216-073-11	THICK FILM 10K 1/10W	
R076	1-247-750-11	CARBON 680 5% 1/2W	
R077	1-216-073-11	THICK FILM 10K 1/10W	
R079	1-216-097-11	THICK FILM 100K 1/10W	
R080	1-216-097-11	THICK FILM 100K 1/10W	
⚠R101	9-900-394-01	NON-FLAMABLE CARBON 1M 1/2W	(A660K)
⚠R102	1-215-863-11	METAL OXIDE FILM 100K 1W	(A660K)
⚠R102	1-215-878-11	METAL OXIDE FILM 33K 1W	(K50)
⚠R103	1-215-863-11	METAL OXIDE FILM 100K 1W	(A660K)
⚠R103	1-215-878-11	METAL OXIDE FILM 33K 1W	(K50)
⚠R104	1-214-921-11	CARBON 220K 1/2W	
⚠R105	1-214-921-11	CARBON 220K 1/2W	(A660K)
⚠R106	1-215-860-51	METAL OXIDE FILM 33 1W	(A660K)
⚠R106	1-215-858-11	METAL OXIDE FILM 15 1W	(K50)
⚠R107	1-215-927-51	METAL OXIDE FILM 47K 3W	(A660K)
⚠R107	1-215-924-11	METAL OXIDE FILM 15K 3W	(K50)
⚠R108	1-212-974-11	NON-FLAMABLE CARBON 47 1/2W	
⚠R109	9-909-670-01	METAL FILM 0.22 1/2W	
⚠R110	9-909-671-01	CEMENT 0.1 2W	(A660K)

Note:	**Note:**
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

POWER BLOCK PW-720

Ref. No.	Part No.	Description		Remarks
⚠R110	9-933-751-01	CEMENT	0.05	2W (K50)
⚠R111	1-249-408-11	CARBON	180	1/4W
⚠R112	1-212-958-11	NON-FLAMABLE CARBON	10	1/2W
⚠R113	1-247-831-31	CARBON	2.2K	1/4W (K50)
⚠R114	1-247-848-31	CARBON	5.1K	1/4W
⚠R115	1-247-855-31	CARBON	10K	1/4W
⚠R116	1-247-891-31	CARBON	330K	1/4W
⚠R117	1-247-891-31	CARBON	330K	1/4W
⚠R118	1-212-966-11	NON-FLAMABLE CARBON	22	1/2W
⚠R201	9-909-679-01	FUSE	0.22	1/4W
⚠R202	1-247-855-31	CARBON	10K	1/4W
R203	1-249-404-11	CARBON	82	1/4W
⚠R204	1-247-847-11	CARBON	4.7K	1/4W
⚠R205	1-247-847-11	CARBON	4.7K	1/4W
R206	1-249-404-11	CARBON	82	1/4W
⚠R207	1-247-855-31	CARBON	10K	1/4W
⚠R208	1-247-847-11	CARBON	4.7K	1/4W
⚠R209	1-247-847-11	CARBON	4.7K	1/4W
⚠R210	1-260-099-11	CARBON	1K	1/2W
⚠R211	1-247-839-31	CARBON	2.2K 5%	1/4W
⚠R212	1-247-839-31	CARBON	2.2K 5%	1/4W
R213	1-249-432-11	CARBON	18K	1/4W
R214	1-249-433-11	CARBON	22K	1/4W
⚠R215	1-247-855-31	CARBON	10K	1/4W
⚠R221	1-247-855-31	CARBON	10K	1/4W
R225	1-247-855-31	CARBON	10K	1/4W
⚠R226	1-247-871-11	CARBON	47K	1/4W
⚠R227	1-249-439-11	CARBON	68K	1/4W
		< SWITCH >		
⚠SW101	1-572-675-11	POWER SWITCH	(A660K)	
		< TRANSFORMER >		
⚠T101	9-909-674-01	SWITCHING TRANSFORMER (A660K)		
⚠T101	9-933-753-01	SWITCHING TRANSFORMER (K50)		
		< THERMISTOR >		
⚠TH101	9-904-783-01	POWER THERMISTOR		
		< VARIABLE RESISTOR >		
⚠VR201	1-223-236-11	CARBON TRIMMER POTENTIOMETER 1K		
⚠VR202	1-223-239-11	CARBON TRIMMER POTENTIOMETER 10K		

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Ref. No.	Part No.	Description			Remarks
*	A-6423-320-A	PW-720 BOARD, COMPLETE **********************			
					(Ref.No.3,000 Series)
		< CAPACITOR >			
C501	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C502	1-163-031-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
CN501	1-506-486-11	PIN, CONNECTOR 7P			
		< DIODE >			
D503	8-719-981-49	DIODE GL3ED8			
D504	8-719-981-49	DIODE GL3ED8			
		< IC >			
IC501	8-749-923-11	IC GP1U58XB			
		< TRANSISTOR >			
Q501	8-729-901-05	TRANSISTOR DTA124EK			
		< RESISTOR >			
R501	1-216-089-00	METAL CHIP	47K	5%	1/10W
R502	1-216-079-00	METAL CHIP	18K	5%	1/10W
R503	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R504	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R505	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R506	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R507	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R508	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R509	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R510	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R511	1-216-041-00	METAL CHIP	470	5%	1/10W
R512	1-216-037-00	METAL CHIP	330	5%	1/10W
R513	1-216-037-00	METAL CHIP	330	5%	1/10W
R514	1-216-037-00	METAL CHIP	330	5%	1/10W
R515	1-216-037-00	METAL CHIP	330	5%	1/10W
R522	1-216-295-91	CONDCTOR, CHIP (2012)			
		< VARIABLE RESISTOR >			
RV501	1-241-646-11	RES, VAR, CARBON 10K			
		< SWITCH >			
S501	1-762-365-21	SWITCH, TACTILE (10)			
S502	1-762-365-21	SWITCH, TACTILE (9)			
S503	1-762-365-21	SWITCH, TACTILE (8)			

Note: The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	**Note:** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

Ref. No.	Part No.	Description	Remarks
S504	1-762-365-21	SWITCH, TACTILE (7)	
S505	1-762-365-21	SWITCH, TACTILE (6)	
S506	1-762-365-21	SWITCH, TACTILE (5)	
S507	1-762-365-21	SWITCH, TACTILE (4)	
S508	1-762-365-21	SWITCH, TACTILE (3)	
S509	1-762-365-21	SWITCH, TACTILE (2)	
S510	1-762-365-21	SWITCH, TACTILE (1)	
S511	1-762-365-21	SWITCH, TACTILE (OPEN/CLOSE)	
S512	1-762-365-21	SWITCH, TACTILE (POWER)	

****

Ref. No.	Part No.	Description	Remarks
*	A-6423-303-A	SW-732 BOARD, COMPLETE	

****

(Ref.No.4,000 Series)

< CONNECTOR >

Ref. No.	Part No.	Description	Remarks
* CN461	1-565-042-11	HOUSING, CONNECTOR (PC BOARD) 5P	

< JUMPER RESISTOR >

Ref. No.	Part No.	Description	Remarks
JR461	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR462	1-216-296-00	METAL CHIP 0 5% 1/8W	

< PHOTO INTERUPTER >

Ref. No.	Part No.	Description	Remarks
PH461	8-729-020-74	DIODE GP1S24	
PH462	8-729-020-74	DIODE GP1S24	
PH463	8-729-020-74	DIODE GP1S24	

< RESISTOR >

Ref. No.	Part No.	Description	Remarks
R461	1-216-194-00	METAL CHIP 680 5% 1/8W	
R462	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R463	1-216-039-00	METAL CHIP 390 5% 1/10W	
R464	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R465	1-216-248-00	METAL GLAZE 120K 5% 1/8W	

****

MISCELLANEOUS

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Ref. No.	Part No.	Description	Remarks
62	1-769-653-11	CABLE, FLAT (FFC) 7 ARBOR	
63	1-769-655-11	CABLE, FLAT (FFC) 23 ARBOR	
64	1-769-654-11	CABLE, FLAT (FFC) 12 ARBOR	
65	1-769-652-11	CABLE, FLAT (FFC) 19 ARBOR	
⚠68	1-574-085-11	CORD, POWER (K50)	
⚠68	1-575-912-21	CORD, POWER (A660K)	
⚠168	8-848-286-11	DEVICE, OPTICAL KHS-150A	
170	1-751-083-11	CABLE, FLEXIBLE FLAT (18 CORE)	
172	1-769-680-11	CABLE, FLAT (FFC) 4 ARBOR	
M421	X-3944-693-1	TILT MOTOR ASSY	
M481	1-541-309-11	MOTOR, LOADING (RF-370C)	
M901	1-698-109-11	MOTOR, DD (SPINDLE)	

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ACCESSORIES & PACKING MATERIALS

****

Ref. No.	Part No.	Description	Remarks
	1-473-110-21	REMOTE COMMANDER (RMT-M36A)	
	1-569-008-11	ADAPTER, CONVERSION 2P (A660K:E)	
	1-574-085-11	CORD, POWER (K50)	
	1-575-334-11	CORD, CONNECTION (A/V CABLE)(1.5m)	
	3-759-925-11	MANUAL, INSTRUCTION (ENGLISH/CHINESE/SPANISH) (A660K:E, Hongkong)	
	3-759-925-41	MANUAL, INSTRUCTION (ENGLISH/CHINESE) (A660K:Chinese)	
	3-759-925-21	MANUAL, INSTRUCTION (ENGLISH/FRENCH) (K50)	
*	3-961-945-11	INDIVIDUAL CARTON (A660K:E)	
*	3-961-945-21	INDIVIDUAL CARTON (A660K:Chinese)	
*	3-961-946-01	CUSHION (UPPER)	
*	3-961-947-01	CUSHION (LOWER)	

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HARDWARE LIST

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#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S
#3	7-685-645-79	SCREW +BVTP 3X6 TYPE2 IT-3
#4	7-624-105-04	STOP RING 2.3, TYPE -E
#5	7-671-155-01	STEEL BALL 3.0
#7	7-685-103-19	SCREW +P 2X5 TYPE2 SLIT
#8	7-621-759-65	+PSW, 2.6X8
#9	7-628-253-05	SCREW +PS 2X4
#10	7-682-946-09	SCREW +PSW 3X5
#11	7-623-212-22	SW 5, TYPE 2
#12	7-624-190-81	STOP RING 2, TYPE-CS
#13	7-621-759-35	+PSW, 2.6X5
#14	7-684-220-02	NUT 3, HEXAGON CAP
#15	7-685-134-19	SCREW +P 2.6X8 TYPE2 NON-SLIT
#16	7-685-659-79	SCREW +P 4X8 TYPE2 NON-SLIT

SECTION 6
IC PIN DESCRIPTION

6-1. TERMINAL FUNCTION OF SYSTEM CONTROL MICROCOMPUTER (IC501: MB89094PF-G-139-BND on the MB-717 Board)

Pin No.	Signal	I/O	Function
1	CL1	O	32 kHz clock (Open connection).
2	CL0	I	32 kHz clock.
3	MOD0	I	(Connected to GND).
4	MOD1	I	(Connected to GND).
5	X0	I	2 fsc clock (7.159 MHz).
6	X1	O	2 fsc clock (Open connection).
7	VSS	I	GND.
8	$\overline{\text{MRST}}$	I	Mechanism controller reset signal (L: Reset).
9	$\overline{\text{FREQ}}$	I	Philips code (frame number) read enable.
10	FQACK	O	Philips code/Sub Q (sub code) data output control signal (H: Data output).
11	FQSEL	O	Philips code/Sub Q data switch (L: Sub Q).
12	JPCTRL	O	One track jump (1TJ)/Multi track jump (MTJ) switching signal (H: 1TJ).
13	SPLOCK	I	Spindle servo lock signal (H: The spindle servo is being locked).
14	TBCHOLD	O	Chroma TBC control signal.
15	SCOR	I	H when the sub code sync. is detected.
16	$\overline{\text{PB V}}$	I	Playback V sync signal input.
17	$\overline{\text{REF V}}$	I	Reference V sync signal input.
18	ALT	O	Signal output to latch the register A inside the expansion output port IC (IC502 on the MB-712 board).
19	BLT	O	Signal output to latch the register B inside the expansion output port IC (IC502 on the MB-712 board).
20	BUSY	I	Communication enable signal sent from the mode controller (L: Communication enabled).
21	DOP	I	Input signal from the video dropout detector (Not used)
22	VTM	I	V timing signal input for servo processor (Not used)
23	FLAG	I	Flag input enabling operation of reference system (Not used)
24	CDGIN	I	H at CDG mode. (Disc discrimination output from decoder IC) (Not used)
25	CLSCS	O	Chip select of the CLS DT (pin 29).
26	SPDLPLS	O	Pulse output to drive the spindle servo (H: The spindle runs free).
27	CLT	O	Output signal to latch the CLD register
28	CMOD	I	Input signal to select the start mode after reset is released (+ 5 V pull-up).
29	CLSDT	I	V sync. phase difference data input during CLV scan from IC502 (Data is input while the CLS CS is H).
30	SETDT	O	Serial data output to the DSP/expansion output port IC.
31	SETCK	O	Serial data transfer clock to the IC502, DSP.
32	SPDLFG1	I	Spindle FG input 1 (12 pulses per rotation).
33	GMUTE	O	Gray picture mute control output during CLV scan (L: playback picture, H: gray picture).
34	LD SEARCH	O	Spindle servo control signal output (H: LD search).
35	SPDL F/$\overline{\text{R}}$	O	Spindle rotation direction signal (H: FWD).
36	AUXSEL	O	H when signal is externally input (including CD-G).
37	JMP TRIG	O	Track jump trigger pulse output.
38	MWRQ	O	Output signal requesting to download the memory picture (Not used)
39	MEMORY	O	Output signal to switch between memory or through-out picture
40	MSTART	I	Memory picture downloading in progress
41	MTJ	I	MTJ tracking pulse output. This pin is normally set to input with Hi impedance. This pin is set to output when track jump (TJ) is in progress (L: FWD).
42	MTF ON/$\overline{\text{OFF}}$	O	MTF correction ON/OFF signal (H: MTF ON).
43	VLOAD	O	Output signal to latch the video IC (MN8811).
44	HSPD	O	Output signal to make easy to read H: p_code.
45	PMOFF	O	Output signal to phase-modulate the read-out clock H: OFF.
46		-	N. C.
47	BLK_LEVEL	O	Theater mode (H: ON) (Not used)
48	XFL	I	Focus lock signal input (L: Focus is locked).
49	VCC	I	Power supply pin. REG + 5 V.
50	LINE_SEL	I	H: MMI is being connected to the FSIO.
51	CDG MUTE	O	Graphic data and mute (L: PB, H: Others) (Not used).
52	TILT UP	O	Tilt is enforced to move up.
53	TILT DOWN	O	Tilt is enforced to move down.
54	$\overline{\text{MMICS}}$	O	Serial communication chip select output signal to the mode controller.
55	LOADING	O	Output signal to activate the tray loading.
56	UN LOADING	O	Output signal to activate the tray ejecting.
57	CDG_XRST	O	Output signal to reset the CDG IC (Not used)
58	VSS	I	GND.
59	XLINE MUTE	O	Audio output mute signal (L: Mute).
60	DIG_0MUTE	I	Digital 0 muting information.
61	$\overline{\text{SV DSP RST}}$	O	Output signal to reset the servo, DSP and DF (L: Reset).
62	LD ON	O	Output signal to turn on or off laser diode (H: ON (lights)).
63	$\overline{\text{CD}}$/LD CDV	O	L: while playing back the audio part of CD or CDV. H: Others.
64	XSVLT	O	Output signal to latch the servo IC (HA11529).
65	SIDE A/B	O	Output signal to switch the disc side of the tilt servo (A: H. B: L).
66	BRK_INH	O	Output signal to control the servo brake mode.(H:Inhibit)
67	LCSW1	I	Loading/chucking position sensor input-1.
68	$\overline{\text{LD LED}}$	O	LED illuminating signal output used to discriminate the type of disk (L: illuminating).
69	LCSW2	I	Loading/chucking position sensor input-2.
70	LCSW3	I	Loading/chucking position sensor input-3.
71	SPDL FG2	I	Spindle FG input-2 (Not used).
72	TILT LIMIT	I	Tilt up/down limits switch input.
73	TILT CTR	I	Tilt center position switch input.
74	MECH SI	I	32-byte serial transfer data input (used to check SCOR).
75		-	N. C.
76		-	N. C.
77	MECH SI	I	32-byte serial transfer data input (Input from the mode controller and IC502).
78	MECH SO	O	32-byte serial transfer data output (Output to the mode controller).
79	MECH CLK	O	32-byte serial transfer clock.
80	T CNT	I	Track jump counted input signal.
81		-	N. C.
82		-	N. C.
83	AVSS	I	GND.
84	LD DET	I	A/D input (Detects whether a disk is present or not, and disk size (8- or 12-inch)).
85	SLED1	I	A/D input sled position information (CDV).
86	SLED2	I	A/D input sled position information (CD, ALD and BLD).
87	TRAY_IM	I	Input to A/D when abnormality is detected in the tray drive motor.
88	$\overline{\text{DSPLT}}$	O	DSP IC latch signal.
89	MUTG	O	DSP mute signal (H: Mute).
90	EFM LOCK	I	Frame sync (EFM) lock signal (H: Locked).
91	SENSE	I	SENSE input signals from the DSPs.
92	AVCC	I	Power supply pin. Reg + 5 V.
93		-	N. C.
94	$\overline{\text{EMP ON}}$	O	Emphasis control output (H: Emphasis ON).
95	A MUTE 1	O	Audio L-channel output mode switch (H: Analog audio R mute).
96	A MUTE 2	O	Audio R-channel output mode switch (H: Analog audio L mute).
97	$\overline{\text{CX}}$	O	CX ON/OFF control signal output (L: CX ON).
98	DF_XMUTE	O	Digital filter· soft mute
99	$\overline{\text{DSPSEL}}$	O	Output signal to select communication with the DSP (L: Connect. H: Disconnect).
100	VCC	I	Power supply pin. REG + 5 V.

6-2. TERMINAL FUNCTION OF MODE CONTROL MICROCOMPUTER
(IC102: MB89096 PF-G-172-BND on the FP-744 Board)

Pin No.	Signal	I/O	Function
1	CL1	O	32 kHz clock (Connected at open)
2	CL0	I	32 kHz clock (Connected to GND)
3	MOD0	I	(Connected to GND)
4	MOD1	I	(Connected to GND)
5	X0	I	8 MHz clock
6	X1	O	8 MHz clock
7	VSS	I	GND
8	$\overline{\text{RST}}$	I	Mode controller reset. (L: Reset)
9	$\overline{\text{SEG G}}$	O	Output to LED (L: Illuminate)
10	$\overline{\text{SEG A}}$	O	Output to LED (L: Illuminate)
11	$\overline{\text{SEG F}}$	O	Output to LED (L: Illuminate)
12	$\overline{\text{SEG B}}$	O	Output to LED (L: Illuminate)
13	$\overline{\text{SEG C}}$	O	Output to LED (L: Illuminate)
14	$\overline{\text{SEG E}}$	O	Output to LED (L: Illuminate)
15	$\overline{\text{SEG D}}$	O	Output to LED (L: Illuminate)
16	7CTL	O	Select left or right 7-segment chip (H: lowest digit, L: 10th digit)
17	$\overline{\text{REF V}}$	I	Reference V sync. signal input
18	$\overline{\text{MMI CS}}$	I	Chip select signal sent from the mechanical controller to the mode controller
19	$\overline{\text{E2P BUSY}}$	I	EEPROM write signal. H: Ready. L: Busy
20	DSP RST	O	Inverted logic $\overline{\text{DSP RST}}$ (Controlling mute of SI DATA and SI CLK signals)
21	$\overline{\text{LED STB}}$	O	Strobe output to the LED of FP-745 (open drain port)
22	$\overline{\text{H DET}}$	I	L: Video signal is present (open drain port)
23	$\overline{\text{MIC IN}}$	I	L: MIC IN (open drain port)
24	OTASUKE	I	H: Mic audio does not exist, L: Mic audio exists (open drain port)
25	$\overline{\text{AUX}}$	O	H: AUX switch OFF, L: AUX switch ON
26	DSP CS	O	Chip select signal to the karaoke DSP (L: During transmission)
27	$\overline{\text{DSP RST}}$	O	Reset output to the karaoke DSP
28	CMOD	I	Input selecting start mode after reset is released (+ 5 V pull-up)
29	SI	I	Received data from the EEPROM
30	SO	O	Send data to the EEPROM/karaoke DSP/serial & parallel IC for the LEDs
31	SCK	O	Communication clock to the EEPROM/karaoke DSP/serial & parallel IC for the LEDs
32	SIRCS	I	SIRCS input
33	$\overline{\text{CG CS}}$	O	CG chip select (L: During communication)
34	$\overline{\text{MRST}}$	O	Reset output to mechanism controller (L: Reset)
35	BUSY	O	Transfer enable signal from mode controller to mechanism controller (L: Communication enabled)
36	$\overline{\text{CDG CS}}$	-	N.C.
37	P. CONT	O	Control output to turn ON/OFF the main power of the machine(H:Power on)
38	AU MUTE	O	H: During audio mute
39	AUTO RESUME	O	Output to LED (H: Illuminate)
40	SURROUND	O	Output to LED (H: Illuminate)
41	KARAOKE PON	O	Output to LED (H: Illuminate)
42	KEY +3	O	Output to LED (H: Illuminate)
43	KEY +2	O	Output to LED (H: Illuminate)
44	KEY +1	O	Output to LED (H: Illuminate)
45	KEY 0	O	Output to LED (H: Illuminate)
46	KEY -1	O	Output to LED (H: Illuminate)
47	KEY -2	O	Output to LED (H: Illuminate)
48	KEY -3	O	Output to LED (H: Illuminate)
49	VCC	I	Power supply pin. EVER + 5 V
50	LINE_SEL	O	Output to LED (H: Illuminate)

Pin No.	Signal	I/O	Function
51	VOCAL SUPPORT	O	Output to LED (H: Illuminate)
52	CONT. PLAY	O	Output to LED (H: Illuminate)
53	VFDF	I	GND
54		-	N.C.
55		-	N.C.
56		-	N.C.
57		-	N.C.
58	VSS	I	GND.
59		-	N.C.
60		-	N.C.
61		-	N.C.
62		-	N.C.
63		-	N.C.
64	SIDE B	O	Output to LED (H: Illuminate) (Not used)
65	SIDE A	O	Output to LED (H: Illuminate) (Not used)
66		-	N.C.
67	VCC	I	Power supply pin. EVER + 5 V.
68		-	N.C.
69		-	N.C.
70		-	N.C.
71		-	N.C.
72		-	N.C.
73		-	N.C.
74		-	N.C.
75	LINE SELECT	O	H: Communication with the mechanical controller. L: Communication with the CG
76		-	N.C.
77	MECH SO	I	Data input from the mechanical controller
78	MECH SI	O	Data output to the mechanical controller and CG
79	MECH CLK	O	Communication clock output for the mechanical controller and CG.
80	DOOR SW	I	Door switch (H: Close, L: Open)
81		-	N.C.
82		-	N.C.
83	AVSS	I	GND.
84	PS MON1	I	Input to A/D converter. Monitoring -5 V Regulated power supply
85	PS MON2	I	Input to A/D converter. Monitoring -5 V Regulated power supply
86	KEY L1	I	Input to A/D converter. Monitoring PW-720 key input
87	KEY L2	I	Input to A/D converter. Monitoring PW-720 key input
88	KEY R2	I	Input to A/D converter. Monitoring FP-745 key input
89	KEY R1	I	Input to A/D converter. Monitoring FP-745 key input.
90	J/E/UC	I	Input to A/D converter. Specifying shipping destination
91	PS MON3	I	Input to A/D converter. Monitoring ±12 V
92	AVCC	I	Power supply pin. EVER + 5 V.
93	ECHO VR	I	Input to A/D converter. Monitoring echo control input signal
94	REMOTE CONT	I	Input to A/D converter. Monitoring mic remote input signal
95	KEY C1	I	Input to A/D converter. Monitoring FP-744 key input
96	P. OFF	O	Controlling to turn OFF forcibly the switching power supply (H: Forced OFF)
97	$\overline{\text{E2P WC}}$	O	EEPROM line control output.
98	$\overline{\text{E2P CS}}$	O	EEPROM chip select output.
99	TEST 1	I	Test pin (All LEDs illuminate if this pin is L during reset)
100	VCC	I	Power supply pin. EVER + 5 V.

SECTION 7
ELECTRICAL ADJUSTMENTS

During the adjustments, see the parts alignment diagram for adjustment on page from 7-16.

7-1. LIST OF SERVICING JIGS

- Oscilloscope
- Color monitor TV
- Digital voltmeter
- Frequency counter
- Remote commander (RMT-M36A)
- LD alignment disc HLV-8 (8-797-008-00) NTSC Ref. Disc 8

7-2. CAUTIONS ON ADJUSTMENT

- Disc load/unload operation must not be performed when servicing with the unit laying down sideways. (Never press the OPEN and CLOSE buttons.)
- When laying the unit down sideways, perform adjustment with the left side down and turn the power on.
- When adjusting the servo system, be sure to set up the unit horizontally.

7-3. OPERATION OF THE MDP-A660K/K50 WITH HIDDEN KEY FUNCTIONS

1. Explanation of the hidden key functions

Special control functions to be used for the test or some other purposes of the MDP-A660K/K50 are available by pressing at the same time and in specific order the multiple function keys on the main unit and/or on the remote control unit. The control functions available in this way are called "special key functions".
The special key functions can be used in either of the following modes.

- the service mode
- the debugging mode
- the normal operation mode

The special key functions can be divided into two groups according to the key control operations as follows:

- Simultaneous main-unit-key-press functions
  Some control functions can be used by pressing simultaneously multiple specific keys on the main unit.
- Simultaneous main-and-remote-control-units-key-press functions
  Some other control functions can be used by pressing simultaneously two specific keys on the remote control unit while holding down a specific key on the main unit.

2. How to use "simultaneous main-unit-key-press functions"

The functions available by pressing simultaneously the multiple specific keys only on the main unit are called "simultaneous main-unit-key-press functions". These functions are to be used when a quick operation such as "forced power off" is required.
The following table lists the currently available simultaneous main-unit-key-press functions.

Table 7-1. List of simultaneous main-unit-key-press functions

Keys to be pressed on the main unit	Functions
1 key and POWER key	(1) Forced power off This function turns off power forcibly. It is to be used if you want to turn off the power in the following cases. • Operation of the mechanisms is out of control. • Power cannot be turned off by pressing the power key. Note that this function should be used with care because it may turn off the power in a half way of the operation of the mechanisms.
STOP key and POWER key	(2) Forced reset This function carries out initialization of the mode controller in addition to the forced power off function. It is to be used if you want to reset the mode controller in the following case. Something is wrong with the mode controller such that it operates with incorrect display. Note that once this function has been carried out, all information, including the history of emergency case, other than the trap-flag information in the debugging mode, will be deleted.
B side key + F−ACS + POWER keys (With power off only)	(3) Lighting up all the LEDs on the main unit This function turns on all the LEDs after turning on the power automatically. Until you switched off the power, normal operation is possible while all the LEDs are lit.

3. How to use "simultaneous main-and-remote-control-units-key-press functions"

The functions available by pressing the two specific keys on the remote control unit while holding down the specific key on the main unit are called "simultaneous main-and-remote-control-units-key-press functions". It is necessary to press two keys on the remote control unit within about one second. This prevents an accidental use of these functions by the user.

These functions are to be carried out by using the NEXT DISC RESERVE key NATURAL key so that the operation of the mechanisms is not affected.

The following table lists the currently available simultaneous main-and-remote-control-units-key-press functions.

The NATURAL key can be used instead of NEXT DISC RESERVE key.

Table 7-2. List of simultaneous main-and-remote-control-units-key-press functions

Step	Keys to be pressed on the main unit and on the remote control unit	Functions
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and DISPLAY key (remote control unit)	(1) Debugging mode ON/OFF This function puts the unit in the debugging mode from another mode, or puts the unit in the mode other than the debugging mode from the debugging mode. For details on the debugging mode, refer to 7-5. "OPERATION OF THE MDP-A660K/K50 IN THE DEBUGGING MODE".
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and STOP key (remote control unit)	(2) V mute forced ON/OFF If the forced V mute is ON, it is released. If the forced V mute is OFF, it is turned ON. This function is used to switch the video signal to blue background during playback, or to release the blue background.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and CLEAR key (remote control unit)	(3) Resetting the V mute to normal operating condition Resets the V mute to normal operating condition. This function is used to release the function of above described item (2).
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and +10 key (remote control unit)	(4) Make mechanism controller time out ineffective. Make the function turning power off ineffective when communication with mechanism controller cannot be done. When mechanism controller doesn't operate, it used to hasten to operate mode controller.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and 0 key (remote control unit)	(5) Make mechanism controller time out effctive. Make the function turning power off effective when communication with mechanism controller cannot be done.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and REPEAT key (remote control unit)	(6) EEPROM Clear It can be reserved that the EEPROM content is all cleared instead of storing the favorite program data or debug mode data when the main power is turned off. This operation is effective only when the main power is on.

7-4. OPERATION OF THE MDP-A660K/K50 IN THE SERVICE MODE

1. Explanation of the service mode

The functions for the use on reparation and maintenance (the service mode) are incorporated in the MDP-A660K/K50. The mode in which those functions are available is called "the service mode". The following are the differences between the service mode and the normal operation mode.

(1) Special operations such as focusing search and sledding can be carried out.

(2) Power is not turned off automatically in an emergency condition of power off.

(3) When entering the service mode, also the debugging mode is started automatically. (For details of the debugging mode, refer to 7-5. "OPERATION OF THE MDP-A660K/K50 IN THE DEBUGGING MODE".

2. Entering the service mode

The following procedure shows how to enter the service mode.

(1) While the power is turned off, connect the test pin (TP501 for service mode setting : Pin ③ of CN502), on the MB board of the main unit, to the ground

(2) Turn on the power by pressing the power key of the main unit. Nothing is displayed on the screen at this moment.

(3) Disconnect the test pin (the connection was performed in step (1) above) from the ground.
The service mode can be started when the background color changes in purple. If the background color is blue or black, the service mode is not available yet. If so, restart the procedure from step (1) above.
If a microphone has already connected, and KARAOKE mode has been selected, the back ground is also violet color. Take care not to consufe.
When the unit is in the service mode, it is also put in the debugging mode (the functions those available in both the modes can be used). Therefore, the version No. of the microprocessor appears on the screen. For details of the debugging mode, refer to 7-5. "OPERATION OF THE MDP-A660K/K50 IN THE DEBUGGING MODE".

3. Quitting the service mode

To quits the service mode, press the power key and turn off the power. If you cannot turn off the power in this way (the operation of the mechanisms is not complete), carry out the forced power off function by pressing the reverse direction scan key and the power key on the main-unit at the same time.

4. Operating with the special key functions

The special key functions in the service mode are available only under NO DISC and STOP conditions, for safety purposes.
Check that the indication for those conditions is displayed without flashing on the screen. In order to carry out the special key functions listed in table 7-3, in the status above, turn off the 7 segments LED by pressing the NEXT DISC RESERVE key on the remote control unit while holding down the STOP key on he main unit. And then press the desired key such as PLAY or PAUSE on the main unit.
The sledding motion with the SIDE A or SIDE B key is effective only while holding the Key pressed. However, the operation started with the other keys continues, once it is pressed, until you press the STOP key. While the unit is carrying out the special key function, the LED of AUTO RESUME of the main unit is lit.
Note that multiple special key functions cannot be started even if you press multiple keys at the same time.
When the 7segments LED is turned off, some keys are not effective.
Be sure to turn on the 7 segments LED by pressing the NEXT DISC RESERVE key on the remote control unit, if you don't want to carry out the special key functions.

Table 7-3. List of the special key functions

Key	Special key functions
SIDE A	Sledding in reverse direction (downward)
SIDE B	Sledding in normal direction (upward)
PLAY	Focusing search
PAUSE	Tilt servo ON
STEP FWD	Tray aging starts
STEP REV	Sled aging starts
REPEAT A/B	Tilt aging starts
STOP	Stop special operations

The following are the details of the special key functions available with the MDP-A550

(1) SIDE A key for sledding in reverse direction
The sled can be moved in reverse direction (center of side B, to edge of side B, to edge of side A, and then to center of side A) after completing initialization of the tilt (the tilt is placed in neutral position) by holding down the SIDE A key. To stop the sledding in reverse direction, release the SIDE A key.

(2) SIDE B key for sledding in normal direction
As contrary to item (2) above, the sled can be moved in normal direction (center of side A, to edge of side A, to edge of side B, and then to center of side B). This movement of the sled is desired when replacing the optical part. To stop the sledding in normal direction, release the SIDE B key.

(3) PLAY key for focusing search
Focusing search operation can be carried out repeatedly by press the PLAY key. There is no fault with the unit if the pick-up lens moves up and down.
Be sure to start the focusing search operation after checking the condition that the sled is placed in appropriate position (at around the center of side A). To stop the focusing search operation, press the STOP key.

(4) PAUSE key for tilt servo ON
The tilt servo is activated while pressing the PAUSE key. Move the sled to around the center of side A with the SIDE A and SIDE B keys, and put a CD or equivalent on the tray so that it screens the skew sensor. Then, if the tilt moves by pressing the PAUSE key, operation is normal.
The tilt can be placed back in neutral position by moving the sled with the SIDE A and SIDE B keys. To deactivate the tilt servo, press the STOP key.

(5) STEP FWD --- Tray aging starts.
If STEP FWD key is pressed, tray aging starts. Tray will automatically moves out and in. Take care that the tray will not collapse with surrounding objects.
Press STOP key to terminate aging.

(6) STEP REV --- Sled aging starts.
If STEP REV key is pressed, sled aging starts. Sled will automatically travels between side A and side B.
Press STOP key to terminate aging.

(7) REPEAT A/B --- Tilt aging starts.
If REPEAT A/B key is pressed, tilt aging starts. Tilt will automatically moves up and down.
Press STOP key to terminate aging.

7-5 OPERATION OF THE MDP-A660K/K50 IN THE DEBUGGING MODE

1. Explanation of the debugging mode

The contents in the RAM of the microprocessor can be displayed on the screen for the repair and maintenance purposes. The status of the MDP-A660K/K50 in which this debugging function is available is called "the debugging mode".
The following are the differences between the debugging mode and the normal operation mode.

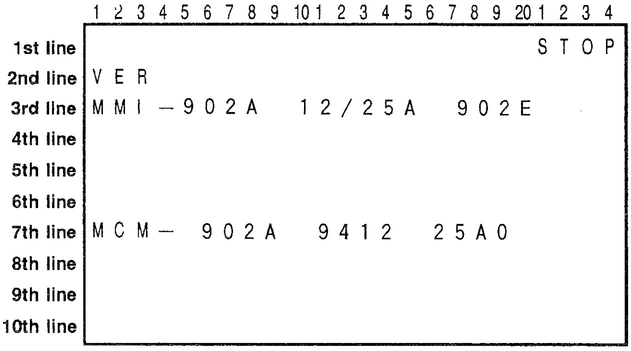
(1) The background color of the screen changes in green. (While the background color is displayed.)

(2) Under the status described item (1) above, pressing the key on the remote control unit displays the history of emergency conditions or other debugging information.
Some keys are not effective when the background color of the screen is green.

2. Entering the debugging mode

To enter the debugging mode from a normal operation mode (in a normal status of operation), turn on the unit, press the 0 key then the STOP key on the remote control unit while holding the NEXT DISC RESERVE key on the main unit. When the following display appears on the screen, the unit is in the debugging mode. This display shows the version No. of the microprocessor. For details, refer to section 7-5 5. (1) "[FRAME/TIME] key for displaying version No. of the microprocessor".

As long as the machine stays in the debug mode, the NEXT DISC RESERVE key has only the function to turn ON and OFF the debug command. While the debug command remains effective, the 7-segment display is not illuminated. If debug command is effective while the background color is displayed (for example, in STOP or PAUSE mode), the background color becomes green. (It becomes purple while in the service mode.)
the KEY CONTROL key can be used instead of NEXT DISC RESERVE key.



```
          1 2 3 4 5 6 7 8 9 101 2 3 4 5 6 7 8 9 201 2 3 4
1st line                                            S T O P
2nd line  V E R
3rd line  M M I  - 9 0 2 A    1 2 / 2 5 A    9 0 2 E
4th line
5th line
6th line
7th line  M C M -   9 0 2 A    9 4 1 2    2 5 A 0
8th line
9th line
10th line
```

Fig. 7-1. Initial display in the debugging mode

3. Quitting the debugging mode

To quits the debugging mode, press the CLEAR key on the remote control unit when the menu (version No. of the microprocessor indication on the screen with green background) in figure (7-1) is displayed.
The same key operation as "2. Entering the debugging mode" also sets the mode back in the normal operation mode.

When the machine returns in the normal operation mode, the "NEXT DISC RESERVE" key has its natural own function only.

4. Changing the display on the screen

The display is set for "debugging display" immediately after entering the debugging mode. The display mode can be changed in the same manner as in the normal operation mode by pressing the DISPLAY key. In the debugging mode, however, "debugging display" mode can be selected as one of the display modes, in addition to "no display (displays nothing in most cases)", "small display (displays only the 1st line in most cases)", and "large display (displays full screen in most cases)" modes.
Pressing the DISPLAY key in the normal operation mode changes the display mode as follows:

No display → Small display → Large display →

Pressing the screen display key in the debugging mode changes the display mode as follows:

No display → Small display → Large display → Debugging display

5. Explanation of the debugging display

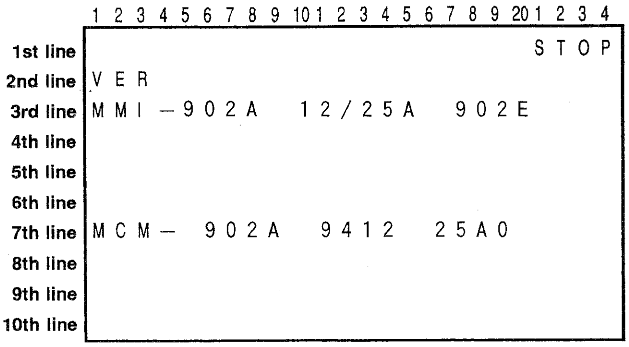
In the debugging display mode, the information on the mode controller is displayed on the screen as a dump list. The title is displayed at the left on the 2nd line from the top. The data is displayed on the 3rd line through the 9th line.
The display of the data in one line consists of up to four sets (total of 8 bytes) of four character (2 bytes character each) sets in hexadecimal notation.

The information to be displayed can be selected in the debugging mode, by first turning off the 7-segment and pressing the desired key (as listed below).
The following table lists the information which are currently available and which can be displayed.

Table 7-4. List of the keys to be used in the debugging mode and corresponding information

Keys	Information to be displayed
[FRAME/TIME]	Version No. of the microprocessor
[1]	History of the function modes
[2]	History of the emergency occurrence
[3]	Information for repair service of normally
[4]	Trap-flag
[5]	Key/remote control data
[7]	Information on communication with the mechanism controller

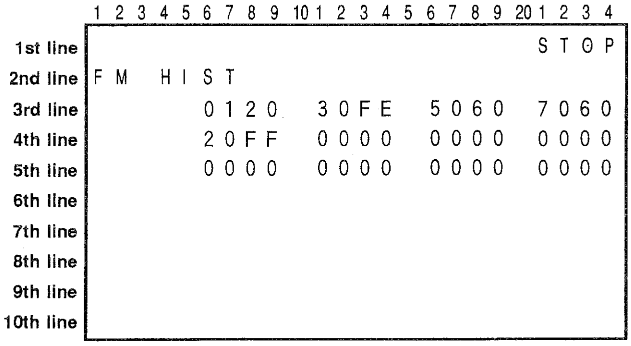
(1) [FRAME/TIME] key for displaying version No. of the microprocessor
Pressing this key displays the version No. of the microprocessor. The version No. of the mode controller appears on the 3rd line, and that of the mechanism controller appears on the 7th line. An example in figure 7-2 shows that the version No. of the mode controller is "MMI-902A 12/25A 902E" and that of the mechanism controller is "MCM-902A 94/12/25A".
The last four letters "902E" of the version No. of the mode controller indicates destination of the machine. The letters "902E" indicates that the machine "902" is designed to be shipped to "E" area. They have the following types of destination.



```
          1 2 3 4 5 6 7 8 9 101 2 3 4 5 6 7 8 9 201 2 3 4
1st line                                            S T O P
2nd line  V E R
3rd line  M M I  - 9 0 2 A    1 2 / 2 5 A    9 0 2 E
4th line
5th line
6th line
7th line  M C M -   9 0 2 A    9 4 1 2    2 5 A 0
8th line
9th line
10th line
```

Fig. 7-2. Version No. of the microprocessor

(2) [1] key for displaying the history of the function modes
Pressing this key displays the history of the principal operation commands (which represent function modes) sent from the mode controller to the mechanism controller.
Up to 8 histories of the function modes can be displayed on a line. A total of 16 histories of the function modes are available using two lines. Unless the unit is unplugged, the data are kept intact in memory even when the unit is turned off.
The data to be stored appears on the screen from left to right 1 byte by 1 byte, and "FF" appears to the right of the last data byte. The data byte continues from the right end on the 1st line to the left end on the 2nd line, and from the right end on the 2nd line to the left end on the 1st line.
The last stored data of the function modes (which is the mode selected at present) appears on the left of "FF".
That is, when "FF" appears at the left end on the 1st (or 2nd, or 3rd) line, the last stored data appears at the right end on the 2nd (or 3rd or 1st) line.
"FE" means there has been an emergency case at the data point. To check the type of the emergency case, refer to 5. (3) "[2] key for displaying the history of the emergency occurrence".



```
           1 2 3 4 5 6 7 8 9 101 2 3 4 5 6 7 8 9 201 2 3 4
 1st line                                           S T O P
 2nd line  F M   H I S T
 3rd line          0 1 2 0   3 0 F E   5 0 6 0   7 0 6 0
 4th line          2 0 F F   0 0 0 0   0 0 0 0   0 0 0 0
 5th line          0 0 0 0   0 0 0 0   0 0 0 0   0 0 0 0
 6th line
 7th line
 8th line
 9th line
10th line
```

Fig. 7-3. History of the function modes

Figure 7-3 shows that the function modes have changed as follows:
01 (Power on start up)
→ 20 (Stop)
→ 30 (Start up of side A)
→ FE (An emergency occurred.)
→ 50 (Searching a chapter)
→ 60 (Playback)
→ 70 (Slow speed scanning in normal direction)
→ 60 (Playback)
→ 20 (Stop) [The last function mode]
Table 7-5 lists the function modes.

Table 7-5. List of the function modes

00	Power OFF
01	Power ON and start up
10	Open
20	Stop
30	Preparation for playback of side A
40	Preparation for playback of side B
50	Searching a chapter
51	Searching a frame/time
60	Playback
61	Pause
70	Slow speed scanning in normal direction
71	High speed scanning in normal direction
72	Slow speed scanning in reverse direction
73	High speed scanning in reverse direction
80	Still playback in normal direction
81	Step playback in normal direction
82	1/90 times speed playback in normal direction
83	1/30 times speed playback in normal direction
84	1/16 times speed playback in normal direction
85	1/8 times speed playback in normal direction
86	1/4 times speed playback in normal direction
87	1/2 times speed playback in normal direction
88	Normal (1 time) speed playback in normal direction
89	2 times speed playback in normal direction
8A	3 times speed playback in normal direction
8B	5 times speed playback in normal direction
8C	10 times speed playback in normal direction
90	Still playback in reverse direction
91	Step playback in reverse direction
92	1/90 times speed playback in reverse direction
93	1/30 times speed playback in reverse direction
94	1/16 times speed playback in reverse direction
95	1/8 times speed playback in reverse direction
96	1/4 times speed playback in reverse direction
97	1/2 times speed playback in reverse direction
98	Normal (1 time) speed playback in reverse direction
99	2 times speed playback in reverse direction
9A	3 times speed playback in reverse direction
9B	5 times speed playback in reverse direction
9C	10 times speed playback in reverse direction
FE	Appears for indicating an occurrence of emergency
FF	Appears next to the last data.

Note: If AC power cord is removed while the machine is operating, the emergency data is all deleted.

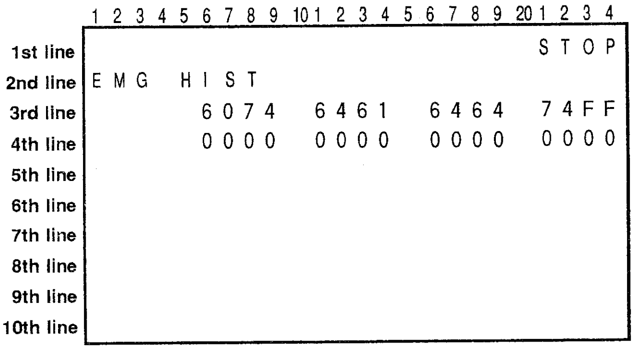
(3) [2] key for displaying the history of the emergency occurrence

Pressing this key displays the history of the emergency occurrence with the code which is an 8-byte code and is issued to the mode controller if an error occurs in the mechanism controller.

Some codes for example "64" (minimum chapter detected) have the meaning of status code only. The codes "80" and higher are generated by the mode controller itself, and are not supplied from the mechanism controller.

The data will be "00" if there has been no emergency case since when the unit has been plugged in.

The display type is the same as that for the history of the function modes. However, up to 16 histories using only two lines are available in this case. The emergency code which appears just before "FF" corresponds to the data of "FE" in the history of the function modes, which is the closest one to "FF".



```
          1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 20 1 2 3 4
1st line                                             S T O P
2nd line  E M G   H I S T
3rd line          6 0 7 4   6 4 6 1   6 4 6 4   7 4 F F
4th line          0 0 0 0   0 0 0 0   0 0 0 0   0 0 0 0
5th line
6th line
7th line
8th line
9th line
10th line
```

Fig. 7-4. History of emergency

Figure 7-4 shows that the emergency has occurred in the following order because the data next to "FF" is 60 on the left of the line.

60 (Detection of lead-in point)
→ 74 (Focusing failed)
→ 64 (Detection of minimum chapter)
→ 61 (Detection of lead-out point)
→ 64 (Detection of minimum chapter)
→ 64 (Detection of minimum chapter)
→ 74 (Focusing failed) [The last emergency]

Table 7-6 lists the emergency codes.

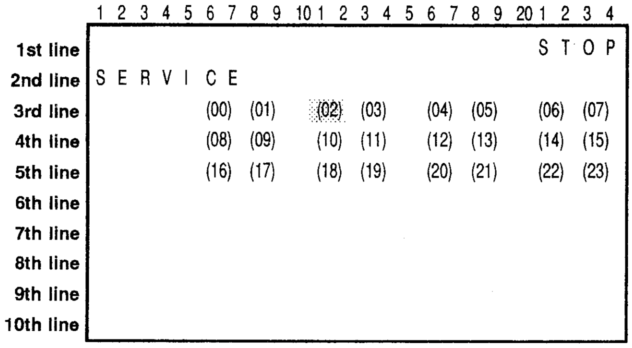
Table 7-6. List of the emergency codes

		Operation after occurence
• For operation of forced modes condition		
01	Requirement of forced power off	Power off
02	Requirement of forced ejection of the tray	Eject
03	Requirement of stop	Stop
04	Requirement of stop when opening the door	Stop
05	Requirement of forced playback	Play
06	Requirement of determination for mode change when power off	Freezes power off display
07	Requirement of power off after communication stops.	Power off
• For operation of mechanisms		
10	Detection of movement for pushing in the tray	Play
11	Detection of no movement of the tray	Power off
20	Detection of no movement of the sleder	Power off
30	Detection of no movement of the tilt	Power off
31	Avoidance treatment execution of no movement of the tilt.	None
• For operation of Spindle control		
40	No detection of the spindle FG	Power off
41	No achievement of continuous servo lock from FG servo to H servo	Stop
42	Above the high rotation limit	Stop
43	Below the low rotation limit	Stop
44	No complete stop operation for the spindle movement	Power off
45	Time over error for the spindle control operation	Power off
• For start up operation		
50	Focusing failed	Stop
51	Focusing failed (with a disc loaded)	Stop
52	Detected as if the disc was an LD	None
53	Focusing of 8 inches LD failed	Stop
54	Reading of TOC failed on a disc of CD or CDV	Stop
• For playback operation		
60	Detection of the lead-in code	Play or soon
61	Detection of the lead-out code	Stop/Pause or soon
62	Detection of the lead-out of part A on CDV	Stop/Pause or soon
63	Detection of a picture stop	Still
64	Detection of the minimum chapter	None
65	Reading of sub code failed on a disc of CD or CDV	Stop
66	Reading of philips code failed and disc of LD	Stop
67	Avoidance treatment execution of locked group	None
• For search operation		
70	Detection of over search	Play
71	Detection of under search	Play
72	Time over for the search operation	Play
74	Focusing failed during searching	Stop
76	Retry execution after focusing failed.	None
• The following emergency occurs in mode contoller		
80	Emergency time out	Power off
81	Search time out	Play
82	Mechanism controller communication time out	Power off
86	Emergency of 12V power supply	power off

(4) [3] key for displaying the information for repair service, sent from the mechanism controller
Pressing this key displays the information sent from the mechanism controller, which is necessarv for repair service. At present, the information listed in table 7-7 is available. Data numbers in the table correspond to the numbers on the 3rd line through the 5th line in figure 7-5.

Table 7-7. Information for repair service, sent form the mechanism controller

Data number	Data
(02)	Mode of mechanisms (internal mode of the mechanism controller) See the following section for details.



```
           1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 20 1 2 3 4
1st line                                              S T O P
2nd line   S E R V I C E
3rd line             (00) (01)  (02) (03)  (04) (05)  (06) (07)
4th line             (08) (09)  (10) (11)  (12) (13)  (14) (15)
5th line             (16) (17)  (18) (19)  (20) (21)  (22) (23)
6th line
7th line
8th line
9th line
10th line
```

Fig. 7-5. Information for repair service sent form the mechanism controller

- About the operation modes of the mechanisms
The operation modes of the mechanisms are the basic operation mode in the mechanism controller. Those almost the same as those available with the unit as the function modes. But, there are several supplemental modes for the mechanisms.
The table below shows the operation modes of the mechanisms.

Table 7-8. Operation modes of the mechanisms

Modes of the mechanisms	Functions
00	Power off
01	Initialization of the mechanism controller (Without operating the mechanisms)
03	In the process from power ON to power OFF
04	In the process from power OFF to power ON
05	Initialization of the mechanisms and related ICs.
10	Ejected status of the tray
11	In the process of ejection of the tray
12	In the process of loading of the tray
20	In stop status with the disc chucking up
21	In the process of chucking up form chucking of side A
22	In the process of chucking of side A from chucking up
23	In chucking status of side A
30	Until focusing of side A has been achieved
31	From lock of focusing to start-up of 0 search
32	In operation from side A/B to stop
33	In process of reversing side B form side A
40	Until focusing of side B has been achieved
50	Chapter search
51	Frame/Time search
60	Play
61	Pause
70	Slow speed normal direction scanning
71	High speed normal direction scanning
72	Slow speed reverse direction scanning
73	High speed reverse direction scanning
74	In the process of scanning completion
80—FF	(The same as function mode)

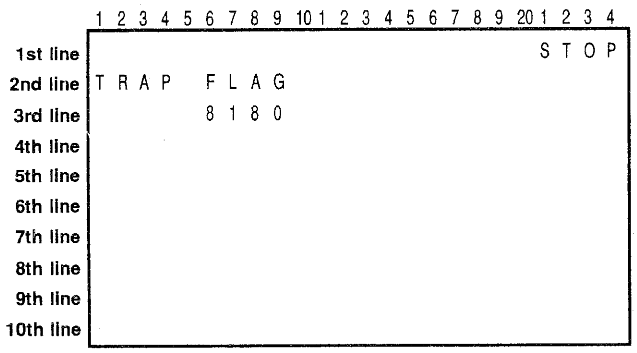
(5) [4] key for displaying the trap-flags

Pressing this key displays the cause of "an abnormal power off" of the mode controller (this excludes when it is turned off with the power key).

The one byte at the right (2 digits of hexadecimal notation) is the flag which has specific meaning. The bit which corresponds to the cause of the last abnormal power off is set 1.

The one byte at the left is the flag for all (logic OR of) the causes of abnormal power off since when the unit has been plugged in.

Both the flags can be set cleared by pressing the clear key when the background color of the screen is green.



```
                                      S T O P
T R A P   F L A G
          8 1 8 0
```

Fig. 7-6. Trap-flag

An example of trap-flag shown in figure 7-6 shows that there have been two cases of abnormal power off before; 80 (power off by abnormal voltage level) and 01 (by forced reset by the user). It also shows that the last abnormal power off has been caused by 80 (abnormal voltage level).

Table 7-9. Trap-flag and bits and their meaning

Bit number (Pattern)	Causes
7 (80h)	Power off caused by abnormal voltage level
6 (40h)	Power off caused by abnormal communication with the mechanism controller
5 (20h)	Power off caused by an occurrence of emergency
4 (10h)	Forced power off by the key operation
3 (08h)	Resetting by self-check of the mode controller
2 (04h)	Resetting by self-check of the mode controller
1 (02h)	Resetting by self-check of the mode controller
0 (01h)	Forced resetting by the key operation

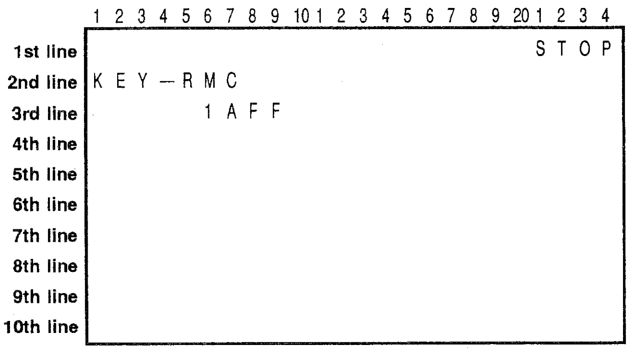
Note : Resetting, which is indicated with bits 0 to 3 in the table, means that setting the status of the mode controller back to the same status as that when the unit was plugged in, except for initialization of the trap-flag.

A of hexadecimal notation is 2+8. In the same manner, B=1+2+8, C=4+8, D=1+4+8, E=2+4+8, F=1+2+4+8.

(6) [5] key for displaying the key/remote control data

Pressing this key displays the key input data of the main unit and the input data by the remote control unit, using SIRCS codes. Note that this operation is effective on the remote control unit for MDPs only.

The one byte (2 digits in hexadecimal notation) on the left of the 3rd line in figure 7-7 is the SIRCS code of the key input data of the main unit, and that on the right is the SIRCS code of the input data by the remote control unit. When no key is pressed or there is no input, "FF" appears. When two keys are pressed almost at the same time, the SIRCS code of the input data by the first pressed key will appear.



```
                                      S T O P
K E Y – R M C
          1 A F F
```

Fig. 7-7. Key and remote control data

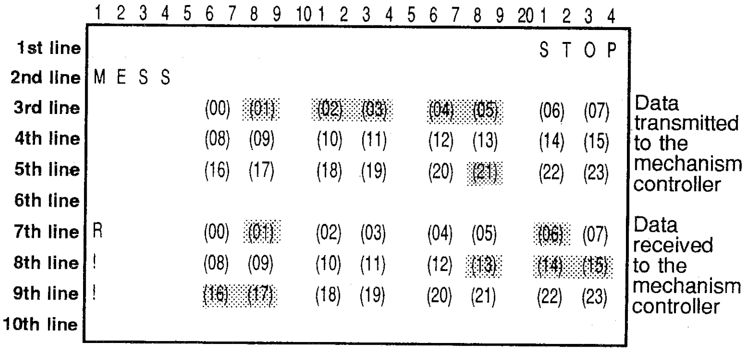
An example figure 7-7 shows that the playback key "1A in hexadecimal notation" on the main unit is pressed but there is no imput "FF (no key is pressed) in hexadecimal notation" from the remote control unit.

However, note that, in some cases, the remote control unit generaters SIRCS codes momentarily only at the moment when the key is pressed.

Table 7-10. List of SIFRCS codes for MDPs

00	Numeral 1
01	Numeral 2
02	Numeral 3
03	Numeral 4
04	Numeral 5
05	Numeral 6
06	Numeral 7
07	Numeral 8
08	Numeral 9
09	Numeral 0
0F	Clear
15	Power ON/OFF
16	Close/open of tray
17	Audio monitoring
18	Stop
19	Pause
1A	Playback
1E	Reverse direction scanning
1F	Normal direction scanning
29	Repeat
2B	Still/step in normal direction
2C	Still/step in reverse direction
30	Reserve
34	ACS in normal direction
35	ACS in reverse direction
38	REPEAT A · B
39	Numeral +10
3A	Screen display
40	Analog audio/CX
46	AUTO PAUSE
5D	side A
5E	side B
5F	KARAOKE PON
60	KEY CONTROL up
61	KEY CONTROL natural
62	KEY CONTROL down
63	SURROUND
64	Numeral 10
65	Numeral 11
66	Numeral 12
67	Numeral 13
77	Numeral 14
79	Numeral 15
7B	Next disc reserve
7E	CONTINUOUS PLAY
(Followings are the extended codes.)	
90	VOCAL
92	VOCAL SUPPORT
94	SELECT
95	AUX IN
FF	Appears when there is no input.

(7) [7] key for displaying the information on communication with the mechanism controller
Pressing this key displays the communication data with the mechanism controller.
The data transmitted from the mode controller to the mechanism controller appears on the 3rd line through the 5th line. The data transmitted from the mechanism controller to the mode controller appears on the 7th line through the 9th line. The exclamation marks [!] at the left on the 8th and the 9th lines indicate that the communication is carried out successfully. Question mark [?] appears if communication stops. A bracket mark [■] appears if communication stops after carrying out once the communication on the purpose of servicing.



1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 20 1 2 3 4
1st line
2nd line
3rd line
4th line
5th line
6th line
7th line
8th line
9th line
10th line
S T O P
M E S S
(00) (01) (02) (03) (04) (05) (06) (07)
(08) (09) (10) (11) (12) (13) (14) (15)
(16) (17) (18) (19) (20) (21) (22) (23)
R
(00) (01) (02) (03) (04) (05) (06) (07)
!
(08) (09) (10) (11) (12) (13) (14) (15)
!
(16) (17) (18) (19) (20) (21) (22) (23)
Data transmitted to the mechanism controller
Data received to the mechanism controller

Fig. 7-8. Information on communication with the mechanism controller.

The table below shows some communication information.

Table 7-11. Principal communication information

Data from the mode controller to the mechanism	
(01)	The function mode at present (next)
(02)	The function mode of final purpose
(03—05)	Target address of search (Time/Frame)
(21)	KARAOKE Door Position
Data from the mechanism controller to the mode controller	
(01)	The function mode at present (next)
(06)	The flag for completion of function mode change (0 bit)
(13)	Current chapter/track number
(14)	Current index number
(15—17)	Current address (Time/Frame)

7-6. POWER SUPPLY ADJUSTMENT

7-6-1. EVER +5V Adjustment (POWER BLOCK)

Mode	Stop
Measurement point	Pin ② of CN052 (Pin ⑦, GND)
Measuring equipment	Digital voltmeter
Adjusting element	VR201
Specified value	5.0 ± 0.3Vdc

Adjustment method :
1) Adjust VR201 to 5.0 ± 0.3V

7-6-2. REG +5V Adjustment (POWER BLOCK)

Mode	Stop
Measurement point	Pin ④ of CN052 (Pin ⑦, GND)
Measuring equipment	Digital voltmeter
Adjusting element	VR202
Specified value	5.0 ± 0.3Vdc

Adjustment method :
1) Adjust VR202 to 5.0 ± 0.3V

7-6-3. Power Supply Check (POWER BLOCK)

Mode	Stop
Measuring equipment	Digital voltmater
UNREG +16V check	
Measurement point	Pin ⑪ of CN051 (Pin ⑫, GND)
Specified value	16.4 ± 1.5Vdc
UNREG -16V check	
Measurement point	Pin ⑭ of CN051 (Pin ⑬, GND)
Specified value	–15.3 ± 1.5Vdc
REG +12V check	
Measurement point	Pin ⑰, of CN051 (Pin ⑱, GND)
Specified value	12.0 ± 0.8Vdc
REG -12V check	
Measurement point	Pin ⑲, of CN051 (Pin ⑱, GND)
Specified value	–12.0 ± 0.8Vdc
REG -5V check	
Measurement point	Pin ⑥ of CN052 (Pin⑦, GND)
Specified value	–5.0 ± 0.3Vdc

- Confirm that the power supply voltages satisfy the respective specified values.

7-7. SYSTEM CONTROL SYSTEM ADJUSTMENT

7-7-1. Microprocessor Clock Adjustment (MB-717 Board)

Mode	Stop
Measurement point	Emitter of Q028 (Pin ⑰ of IC002)
Measuring equipment	Frequency counter
Adjusting element	CT001
Specified value	14318180 ± 40Hz

Adjustment method :
1) Adjust CT001 to 14318180 ± 40Hz.

7-8. SERVO SYSTEM ADJUSTMENT

7-8-1. LD Side A Tilt Balance Adjustment

1) Put the LD alignment disc HLV-8 in with the CAV side to the side A, play it and pause at the chapter 3 (#2201).
2) Connect an oscilloscope to LD RF terminal on the MD adjustment cable and adjust RV401 so that the RF waveform goes maximum in the state the tracking and the sled are on.

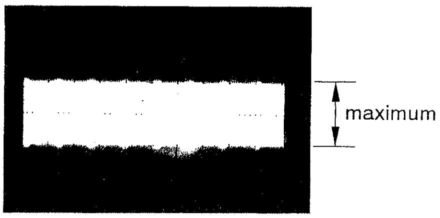


Fig. 7-10.

3) Play #770 and pause.
4) Check that the vertical bar appears on TV monitor and right and left crosstalks (moire) are the same level and minimum.

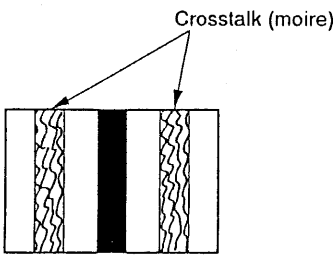
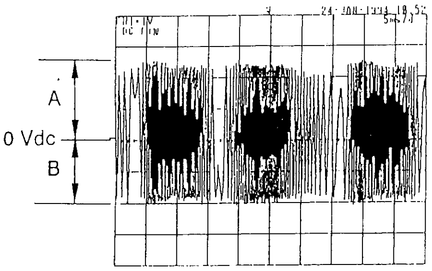

Crosstalk (moire)

Fig. 7-11.

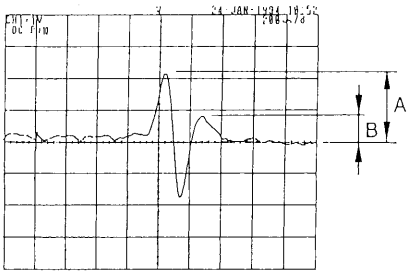
5) Tracking gain and focus gain adjustments are not necessary.
   — Already adjusted at the optical pick-up block side —
6) Check the tracking bal.
   Measure the registance at the Y terminal of TRACKING ERR on jig with oscilloscope.



Check that it meets $-5 \leqq \frac{A-B}{2(A+B)} \times 100\ (\%) \leqq 8$

Fig. 7-12.

7) Then turn on the TRACKING and SLED to check the waveform of 1 track jump in STILL.



Check that it meets $B \leqq \frac{1}{2}A$

Fig. 7-13.

Check the TRACKING BALANCE.

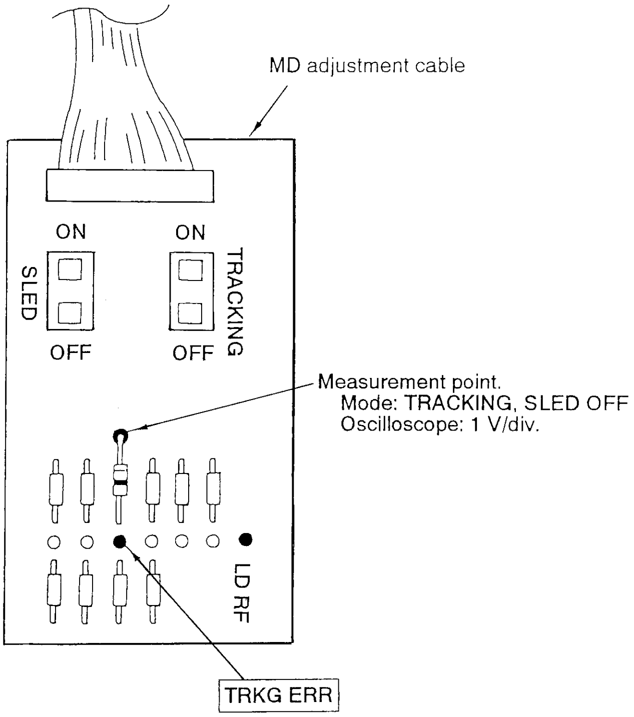

MD adjustment cable
ON
ON
SLED
TRACKING
OFF
OFF
Measurement point.
Mode: TRACKING, SLED OFF
Oscilloscope: 1 V/div.
LD RF
TRKG ERR

Fig. 7-14.

7-8-2. LD Side B Tilt Balance Adjustment

1) Loosen the side B RD screw and TAN screw (hexagonal screw 2.6) on the feed base.
2) Put the LD alignment disc HLV-8 in with the CAV side to the side B, play it and pause at the chapter 3 (#2201).
3) Connect an oscilloscope to LD RF terminal on the MD adjustment cable and adjust RV402 so that the RF waveform goes maximum in the state the tracking and the sled are on.

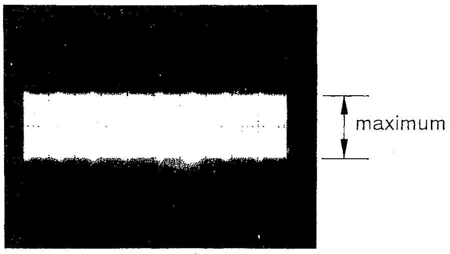
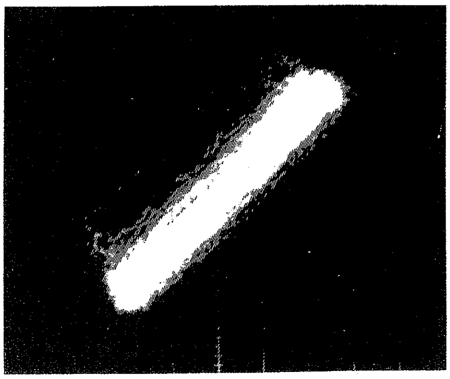


Fig. 7-15.

4) Insert an eccentric screwdriver to B TAN adjustment hole and adjust the RF waveform goes maximum similarly to the item 4).
5) Play #770 and pause.
   At this time in the same manner as the side A, check that the vertical bar appears on TV monitor and right and left crosstalks (moire) are the same level and maximum.
6) Turn off the SLED and tracking, and adjust inserting an eccentric screwdriver to B RD adjustment hole so that the Lissagous waveform meets standard.



Jig terminal : E, F
Oscilloscope : X/Y lissagous 20 mV/div.
Phase difference : Within 35°

Fig. 7-16.

7) Take out the disc to tighten B TAN and RD screw.

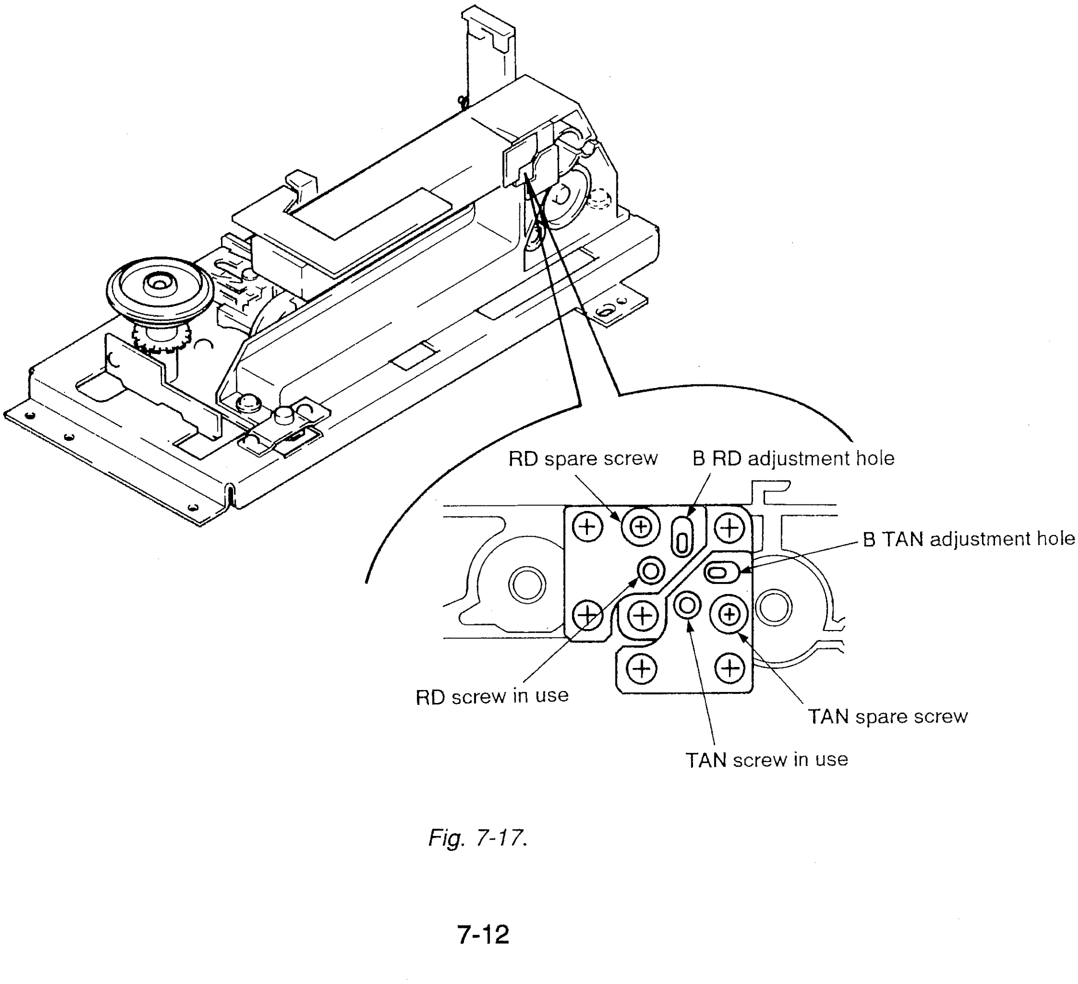


Fig. 7-17.

7-9. VIDEO SYSTEM ADJUSTMENT

7-9-1. Video Output Level Adjustment (MB-717 Board)

Mode	Still
Signal	Frame 4100 (Color bar)
Measurement point	J203 (VIDEO OUT terminal) (Terminated to 75Ω)
Measuring equipment	Oscilloscope
Adjusting element	RV001
Specified value	1.00 ± 0.02 Vp-p

Adjustment method :

1) Select STILL (▶◀) mode.
2) Search the frame 4100 and apply a color bar signal.
3) Adjust RV001 for 1.00 ± 0.02 Vp-p.

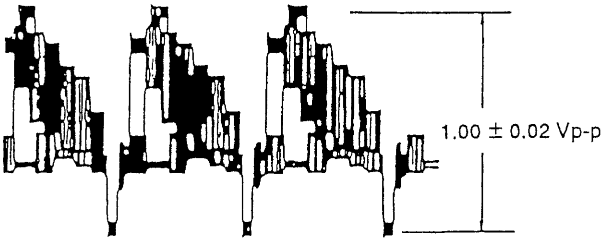


Fig. 7-18.

7-10. ADJUSTMENT AFTER THE ATTACHMENT OF THE OPTICAL PICK-UP BLOCK

7-10-1. Jigs and Tools

- Hexagonal wrench (Tangential screwdriver: 7-700-766-04)
- Oscilloscope
- MD adjustment cable (J-6082-059-B)
- Alignment disc Ref. 8 (HLV-8: 8-797-008-00)/LD YEDS-18 (3-702-101-01) or an equivalent/CD
- Decentering screwdriver 4 ø (J-6095-029-A)

* Insert the terminal of the connector conversion jig to CN401 of the MB-717 Board.

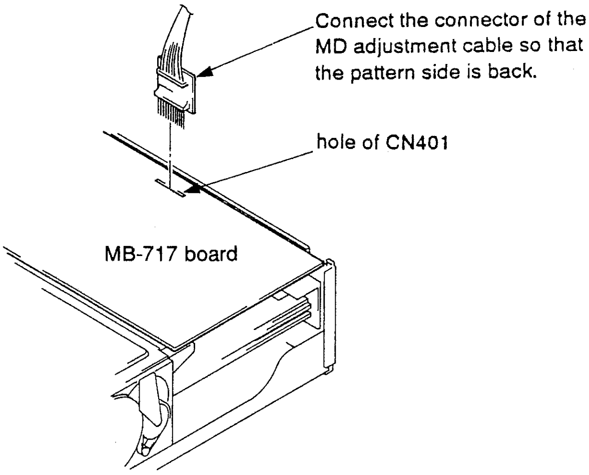

Connect the connector of the MD adjustment cable so that the pattern side is back.
hole of CN401
MB-717 board

Fig. 7-19.

7-10-2. CD Adjustment

1) Loosen the screws of feed base block assembly.

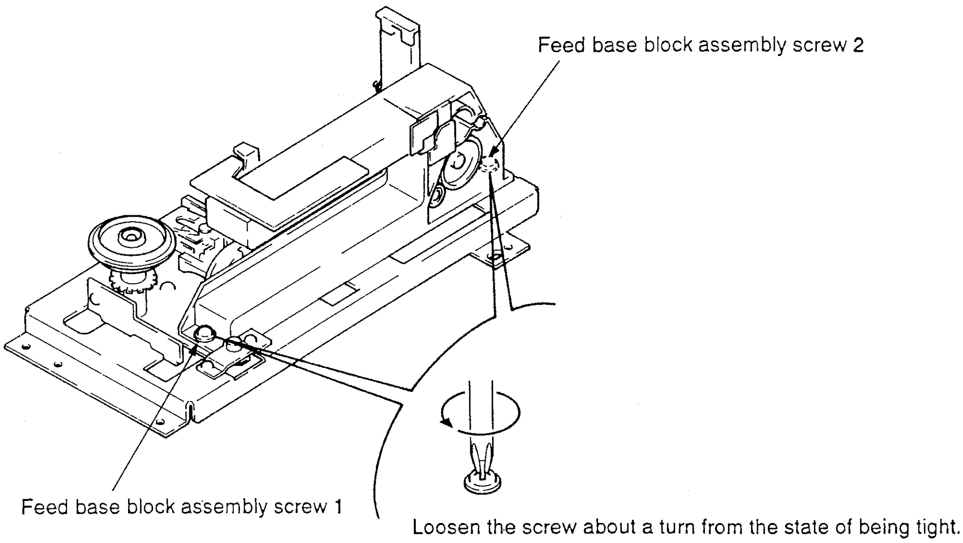

Feed base block assembly screw 2
Feed base block assembly screw 1
Loosen the screw about a turn from the state of being tight.

Fig.7-20

2) Playback the CD alignment disc (YEDS-18) to press the Pause button about 3 seconds later.
3) Connect the oscilloscope to LD RF of the MD adjustment cable to see if the waveform shown below appears.

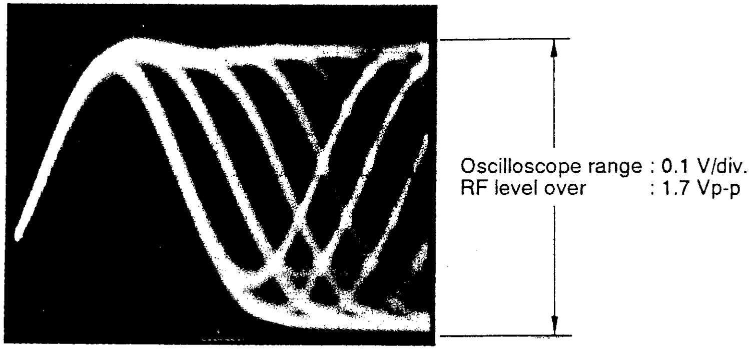


Fig. 7-21.

4) Insert the A TAN screw with hexagonal wrench 2.6 into the hole of top surface of chucking assembly to adjust so that RF Level is maximum. (Over 1.7 Vp-p)

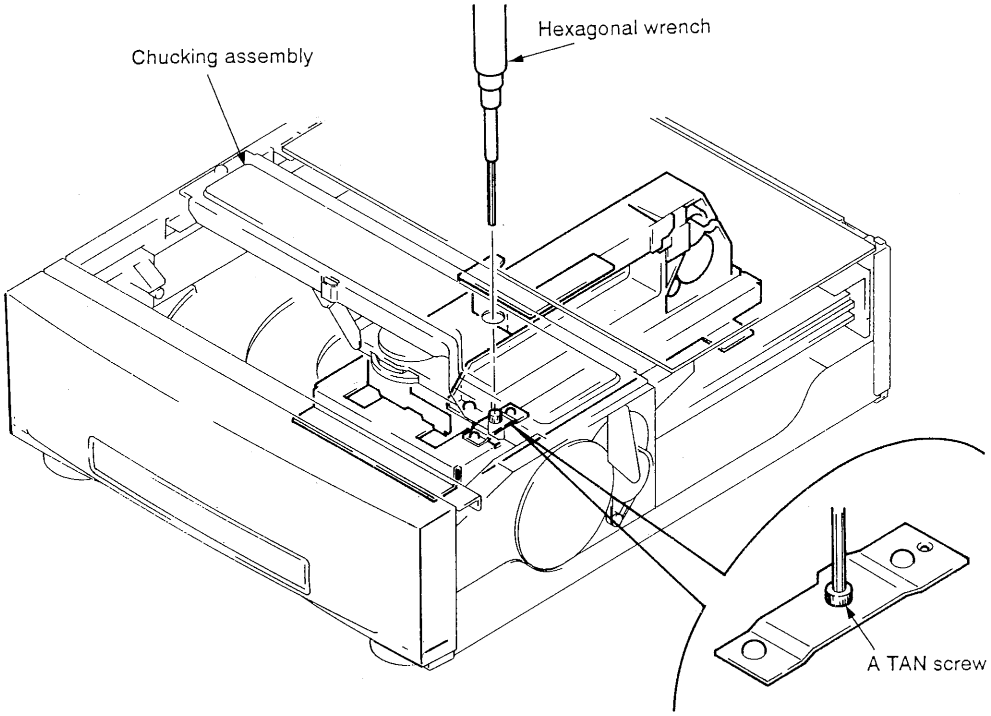

Hexagonal wrench
Chucking assembly
A TAN screw

Fig. 7-22.

5) Insert decentering screwdriver into the feed base block assembly for RD adjustment.

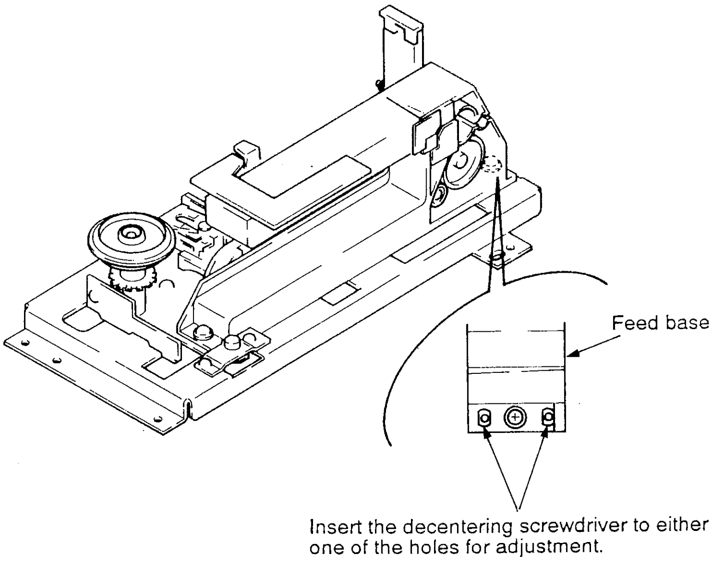

Feed base
Insert the decentering screwdriver to either one of the holes for adjustment.

Fig. 7-23.

6) Take the DISC out to tighten the 2 screws of the feed base.
7) Apply suitable locking compound to A TAN screw.

Terminal E, F/TRK, SLED OFF
Oscilloscope X/Y Lissagous range
Difference within 35° with each 20 mV/div.

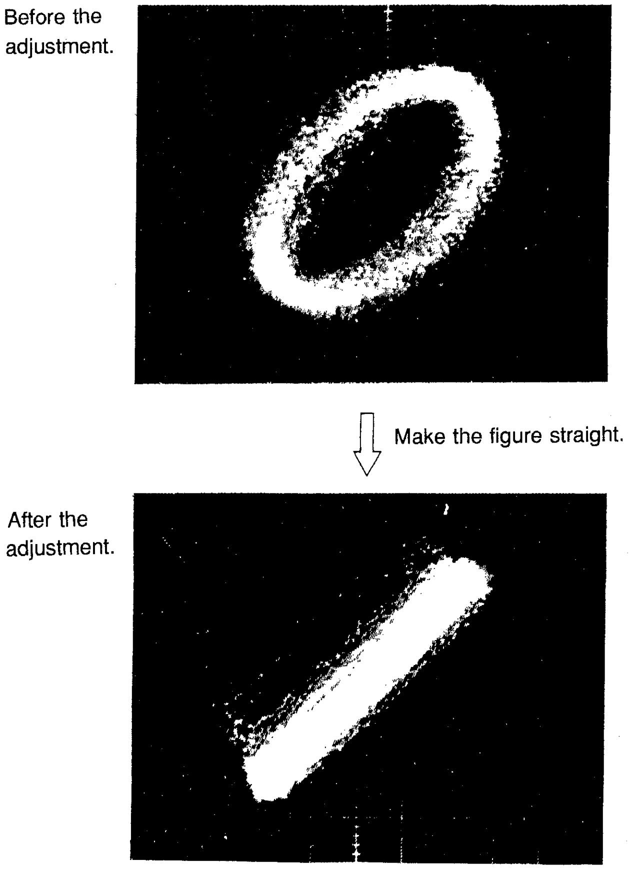
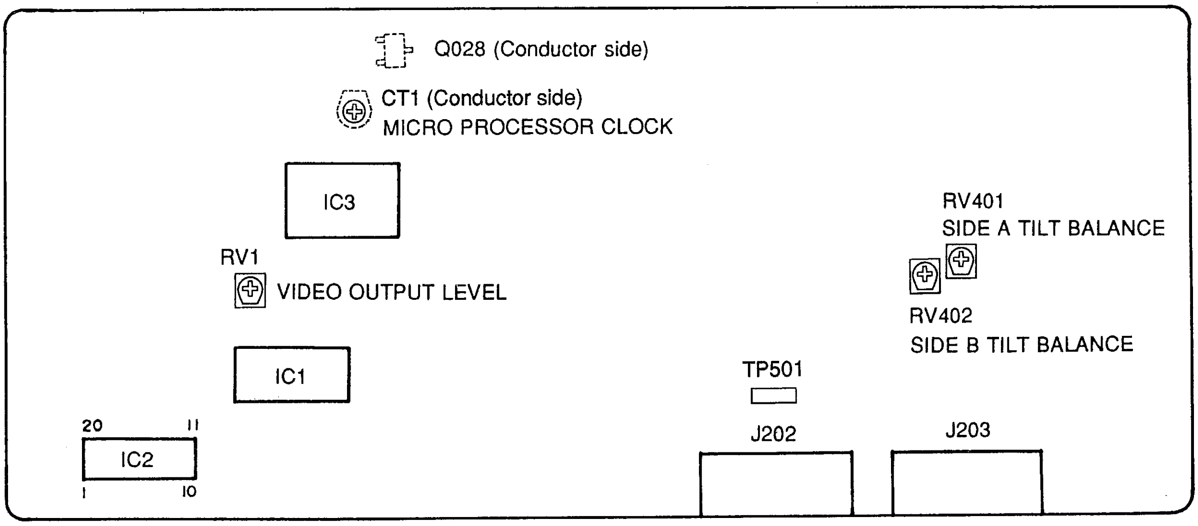

Before the adjustment.
Make the figure straight.
After the adjustment.

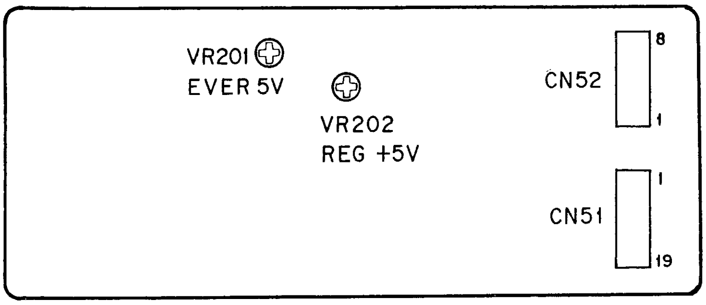
Fig. 7-24.

7-11. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENT

MB-717 Board (Component Side)


Q028 (Conductor side)
CT1 (Conductor side)
MICRO PROCESSOR CLOCK
IC3
RV1
VIDEO OUTPUT LEVEL
IC1
20
11
IC2
1
10
RV401
SIDE A TILT BALANCE
RV402
SIDE B TILT BALANCE
TP501
J202
J203

POWER BLOCK (Component side)


VR201
EVER 5V
VR202
REG +5V
CN52
8
1
CN51
1
19

9-973-708-11

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
95B1648-1
Printed in Japan

© 1995.2

Published by Personal A&V Products Div.
Quality Engineering Dept.

MDP-A660K/K50
RMT-M36A

SONY®

SERVICE MANUAL

US Model
Canadian Model
MDP-K50
E Model
Chinese Model
HongKong Model
MDP-A660K

SUPPLEMENT-1

File this supplement with the Service Manual.

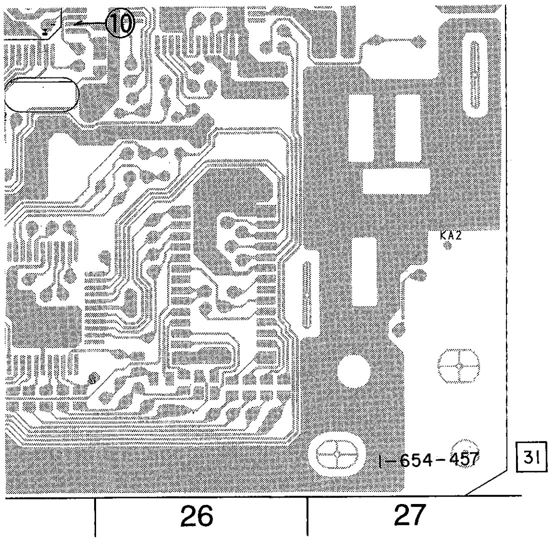
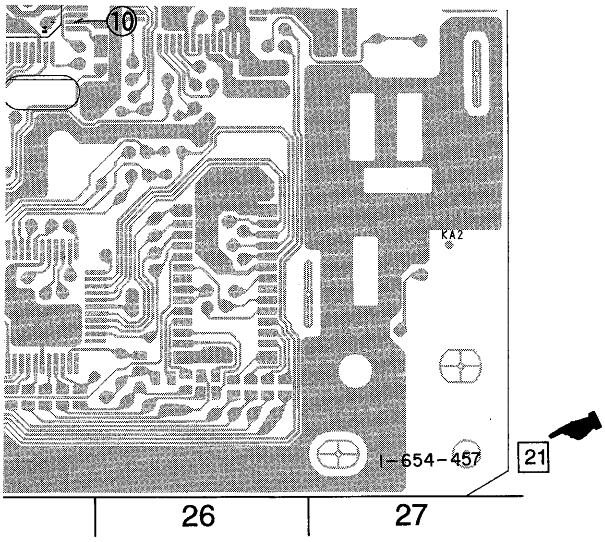
Subject : Change of the POWER BLOCK Printed Wiring Board

- The parts number suffix of the POWER BLOCK printed wiring board is changed as follows.

A660K: E..1-413-989- $\boxed{21}$ → $\boxed{22}$
A660K: Chinese, HongKong ....1-413-989- $\boxed{41}$ → $\boxed{42}$
K50...1-468-020- $\boxed{11}$ → $\boxed{12}$

Note: Main differences between these parts number suffixes are the parts mounted/unmounted, and changes of the parts values.
When repairing (or ordering repair parts) the POWER BLOCK, refer to this SUPPLEMENT-1 regardless of the parts number suffix of the printed wiring boards.

☛ : Indicates corrected portion.

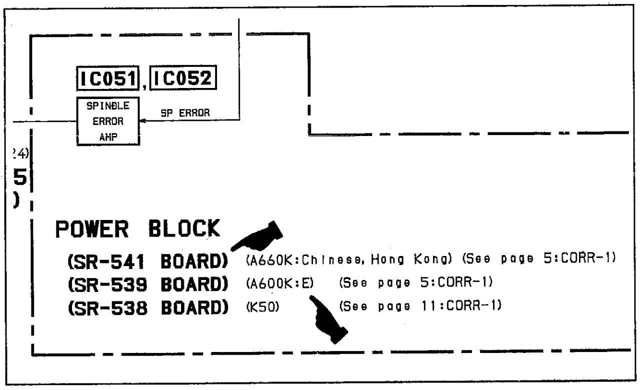
page	INCORRECT	CORRECT
4-10	MB-717 BOARD  	MB-717 BOARD 

· As the parts number suffix of the POWER BLOCK printed wiring board is changed, the following portions are changed. Please correct the Service Manual (9-973-708-11). The full pages of the schematic diagrams, printed wiring boards and electrical parts lists to be corrected are attached from the next page. (Errors in the schematic diagrams and printed wiring boards are corrected.)

☛ : Indicates changed portion.

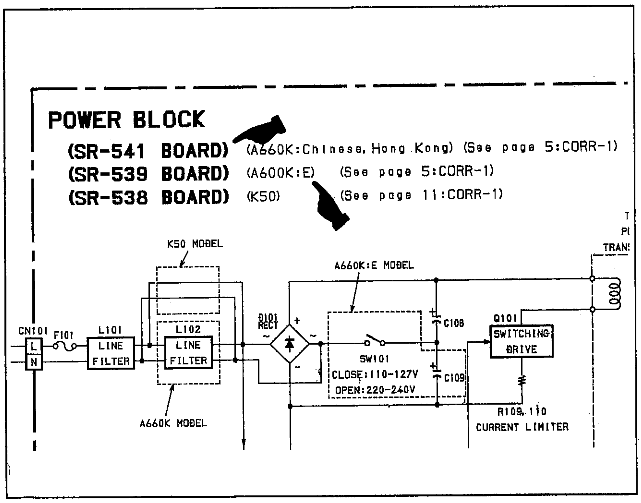
(Page 3-1.)

3-1.OVERALL BLOCK DIAGRAM


IC051, IC052
SPINDLE ERROR AMP
SP ERROR
POWER BLOCK
(SR-541 BOARD) (A660K:Chinese, Hong Kong) (See page 5:CORR-1)
(SR-539 BOARD) (A600K:E) (See page 5:CORR-1)
(SR-538 BOARD) (K50) (See page 11:CORR-1)

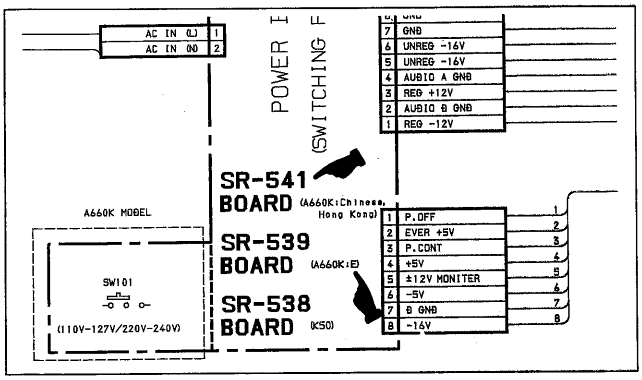
(Page 3-17.)

3-8.POWER BLOCK DIAGRAM


POWER BLOCK
(SR-541 BOARD) (A660K:Chinese, Hong Kong) (See page 5:CORR-1)
(SR-539 BOARD) (A600K:E) (See page 5:CORR-1)
(SR-538 BOARD) (K50) (See page 11:CORR-1)
K50 MODEL
A660K:E MODEL
CN101
F101
L101 LINE FILTER
L102 LINE FILTER
A660K MODEL
D101 RECT
SW101
CLOSE:110-127V
OPEN:220-240V
C108
C109
Q101 SWITCHING DRIVE
R109, 110 CURRENT LIMITER

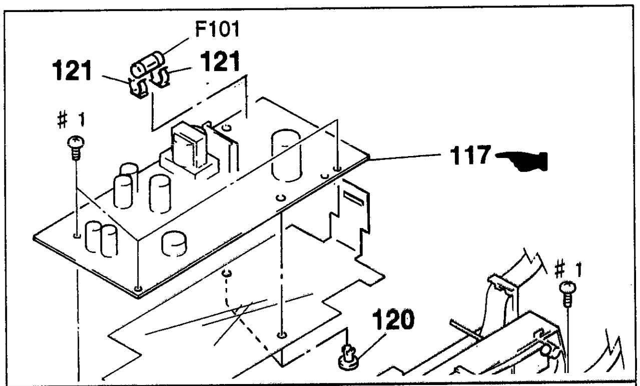
(Page 4-1.)

4-1.FRAME SCHEMATIC DIAGRAM


AC IN (L) 1
AC IN (N) 2
POWER
(SWITCHING
7 GND
6 UNREG -16V
5 UNREG -16V
4 AUDIO A GND
3 REG +12V
2 AUDIO B GND
1 REG -12V
SR-541 BOARD (A660K:Chinese, Hong Kong)
SR-539 BOARD (A660K:E)
SR-538 BOARD (K50)
A660K MODEL
SW101
(110V-127V/220V-240V)
1 P.OFF
2 EVER +5V
3 P.CONT
4 +5V
5 ±12V MONITER
6 -5V
7 B GND
8 -16V

(Page 5-3.)

5-1-3.MAIN CHASSIS ASSEMBLY

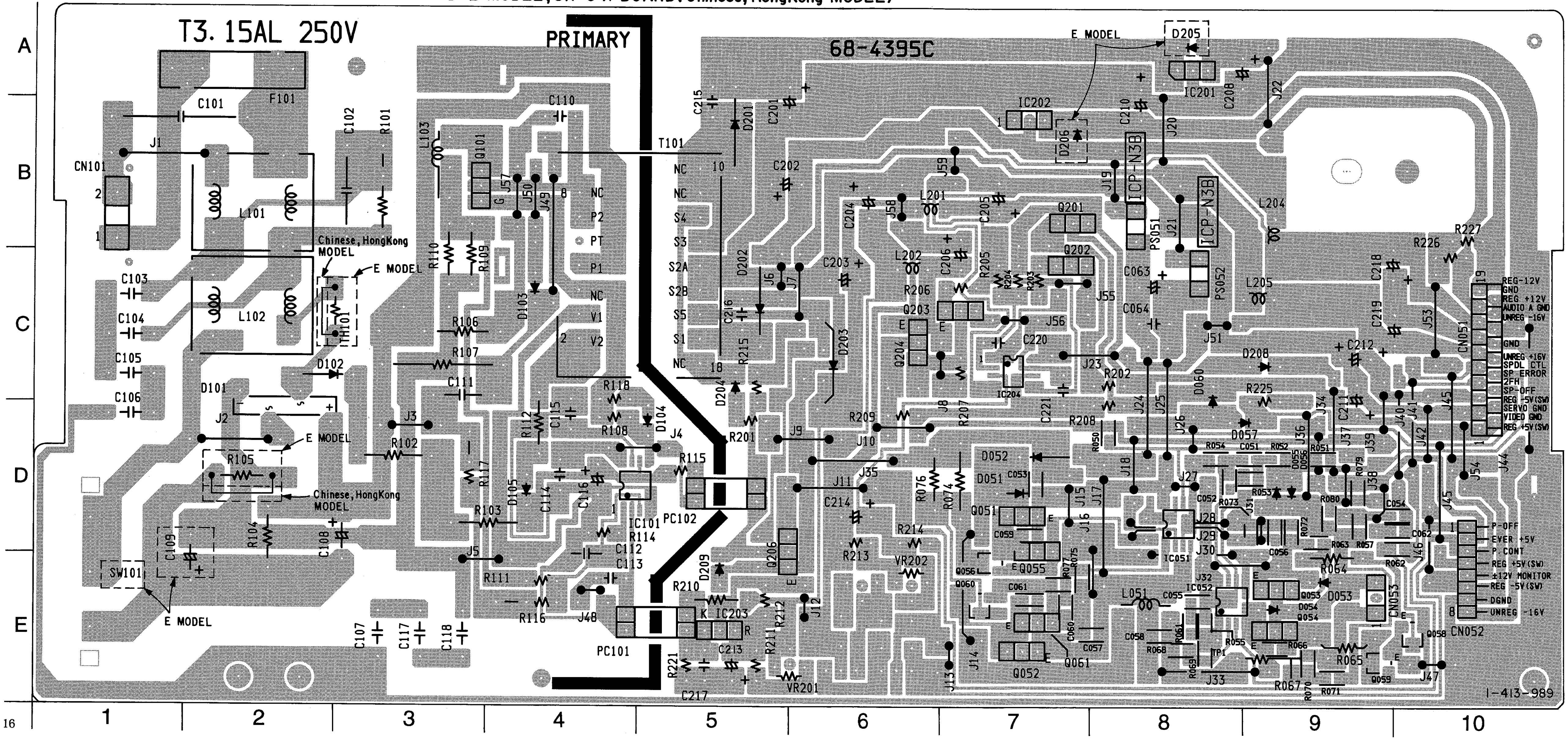

F101
121
121
#1
117
#1
120

Ref. No.	Part No.	Description	Remarks
114	3-962-049-01	SCREW, MOTOR STOPPER	
* 115	1-654-464-11	MT-707 BOARD	
* 116	A-6423-303-A	SW-732 BOARD, COMPLETE	
117	1-413-989-22	POWER BLOCK (A660K:E)	☛
117	1-413-989-42	POWER BLOCK (A660K:Chinese,HongKong)	
117	1-468-020-12	POWER BLOCK (K50)	☛
119	3-962-812-01	SCREW (+BV 3X18)	

POWER BLOCK PRINTED BOARDS (MDP-A660K MODEL)

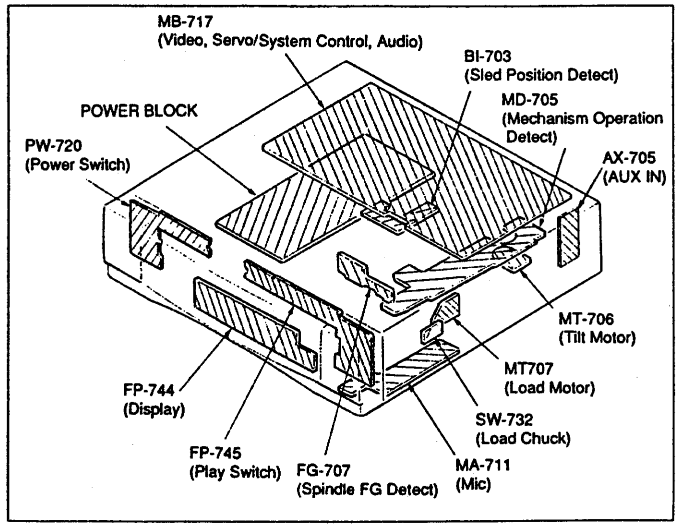
— Ref. No. : POWER BLOCK; 5,000 Series —

POWER BLOCK (A660K MODEL) (SR-539 BOARD:E MODEL, SR-541 BOARD:Chinese, HongKong MODEL)


T3.15AL 250V
PRIMARY
68-4395C
E MODEL
Chinese, HongKong MODEL
CN101
CN051
CN052
CN053
REG-12V
GND
REG +12V
AUDIO A GND
UNREG -16V
GND
UNREG +16V
SPDL CTL
SP ERROR
2FH
SP-OFF
REG -5V(SW)
SERVO GND
VIDEO GND
REG +5V(SW)
P-OFF
EVER +5V
P.CONT
REG +5V(SW)
±12V MONITOR
REG -5V(SW)
DGND
UNREG -16V
T101
PC101
PC102
IC101
IC201
IC202
IC203
IC204
IC051
IC052
F101
SW101
TH101
L101
L102
VR201
VR202
1-413-989
A
B
C
D
E
1
2
3
4
5
6
7
8
9
10

22 : E MODEL

42 : Chinese, HongKong MODEL

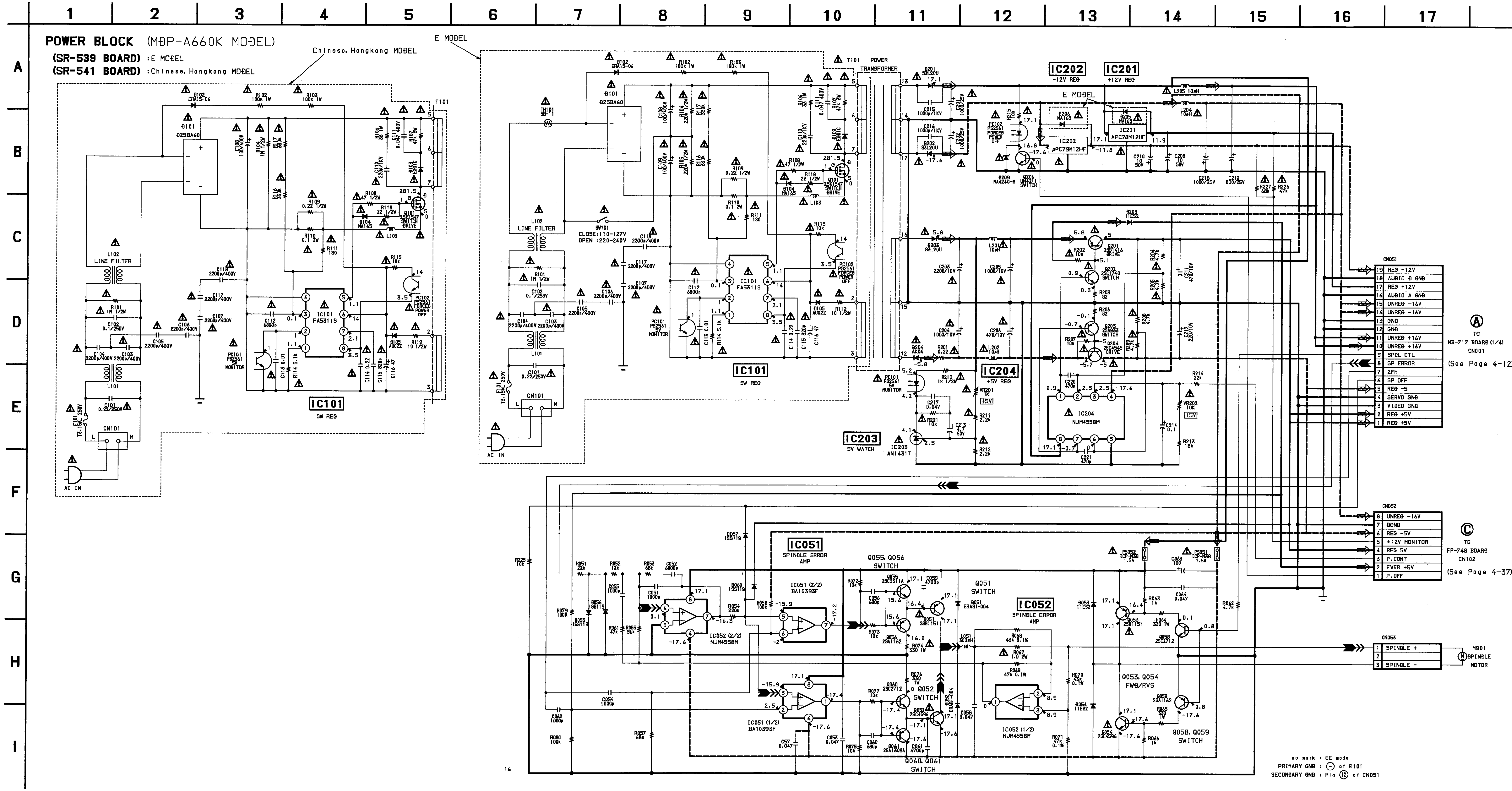

MB-717 (Video, Servo/System Control, Audio)
BI-703 (Sled Position Detect)
POWER BLOCK
MD-705 (Mechanism Operation Detect)
PW-720 (Power Switch)
AX-705 (AUX IN)
MT-706 (Tilt Motor)
MT707 (Load Motor)
FP-744 (Display)
SW-732 (Load Chuck)
FP-745 (Play Switch)
FG-707 (Spindle FG Detect)
MA-711 (Mic)

POWER BLOCK

CN051	C–10
CN052	E–10
CN053	E–9
CN101	B–1
D051	D–7
D052	D–7
D053	E–9
D054	E–9
D055	D–9
D056	D–9
D057	D–9
D060	C–8
D101	D–2
D102	C–2
D103	C–4
D104	D–5
D105	D–4
D201	B–5
D202	C–5
D203	C–6
D204	C–5
D205	A–8
D206	B–7
D208	C–9
D209	E–5
IC051	D–8
IC052	E–8
IC101	D–5
IC201	A–8
IC202	B–7
IC203	E–5
IC204	C–7
Q051	D–7
Q052	E–7
Q053	E–9
Q054	E–9
Q055	D–7
Q056	E–7
Q058	E–10
Q059	E–9
Q060	E–7
Q061	E–7
Q101	B–3
Q201	B–7
Q202	C–7
Q203	C–7
Q204	C–6
Q206	D–5
VR201	E–6
VR202	E–6

POWER BLOCK SCHEMATIC DIAGRAMS (MDP-A660K MODEL)

— Ref. No. : POWER BLOCK; 5,000 Series —


POWER BLOCK (MDP-A660K MODEL)
(SR-539 BOARD) : E MODEL
(SR-541 BOARD) : Chinese, Hongkong MODEL
Chinese, Hongkong MODEL
E MODEL
T101 POWER TRANSFORMER
LINE FILTER
SW101 CLOSE:110-127V OPEN:220-240V
AC IN
IC101 5V REG
IC202 -12V REG
IC201 +12V REG
IC204 +5V REG
IC203 5V WATCH
IC051 SPINDLE ERROR AMP
IC052 SPINDLE ERROR AMP
Q055, Q056 SWITCH
Q051 SWITCH
Q052 SWITCH
Q053, Q054 FWD/RVS
Q058, Q059 SWITCH
Q060, Q061 SWITCH
CN051
19 REG -12V
18 AUDIO D GND
17 REG +12V
16 AUDIO A GND
15 UNREG -16V
14 UNREG -16V
13 GND
12 GND
11 UNREG +16V
10 UNREG +16V
9 SPDL CTL
8 SP ERROR
7 2FH
6 SP OFF
5 REG -5
4 SERVO GND
3 VIDEO GND
2 REG +5V
1 REG +5V
Ⓐ TO MB-717 BOARD (1/4) CN001 (See Page 4-12)
CN052
8 UNREG -16V
7 DGND
6 REG -5V
5 ±12V MONITOR
4 REG 5V
3 P.CONT
2 EVER +5V
1 P.OFF
Ⓒ TO FP-748 BOARD CN102 (See Page 4-37)
CN053
1 SPINDLE +
2
3 SPINDLE -
M901 SPINDLE MOTOR
no mark : EE mode
PRIMARY GND : ⊖ of D101
SECONDARY GND : Pin ⑫ of CN051

·SIGNAL PATH

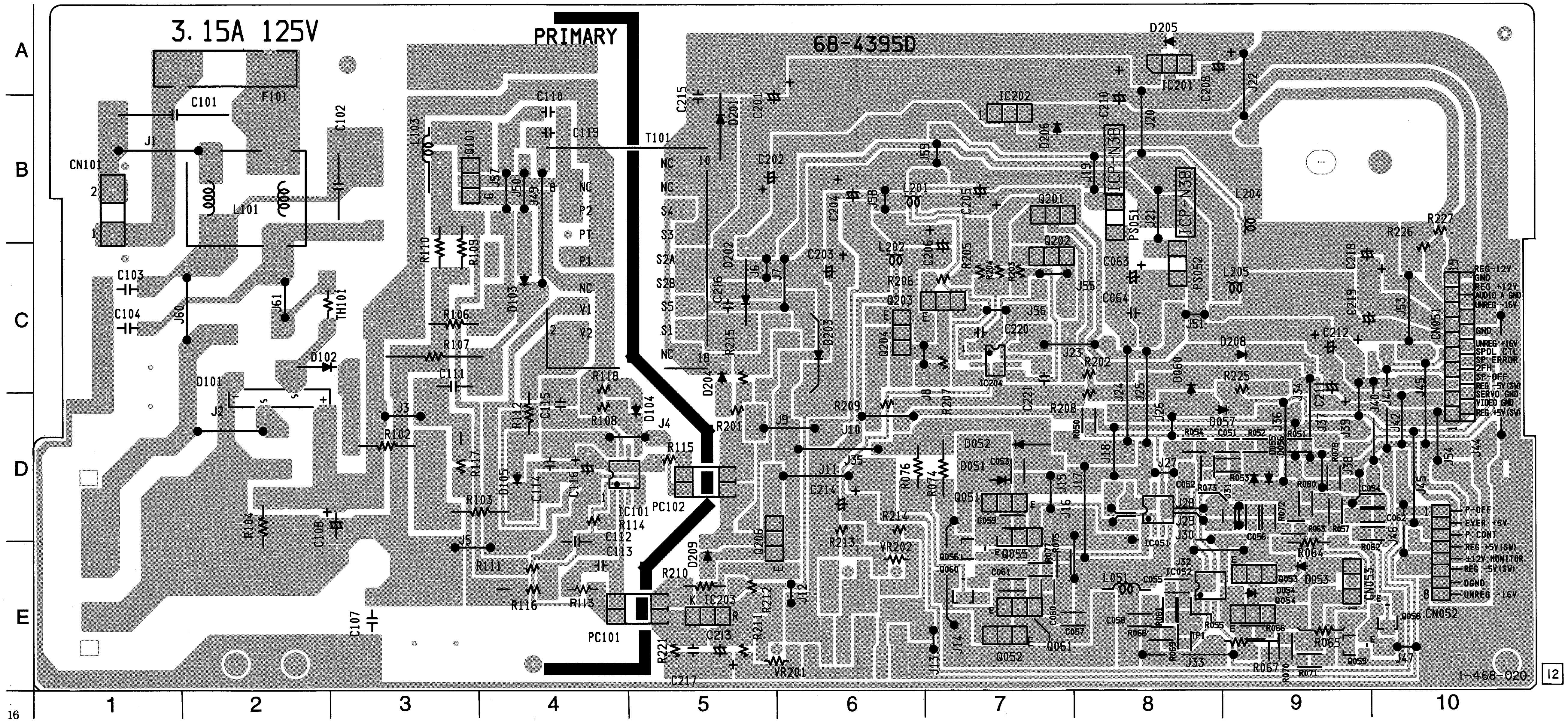
Spindle servo (speed and phase)	➤»»

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

POWER BLOCK PRINTED WRITING BOARDS (MDP-K50 MODEL)

— Ref. No. : POWER BLOCK; 5,000 Series —

POWER BLOCK (K50 MODEL) (SR-538 BOARD)


A
B
C
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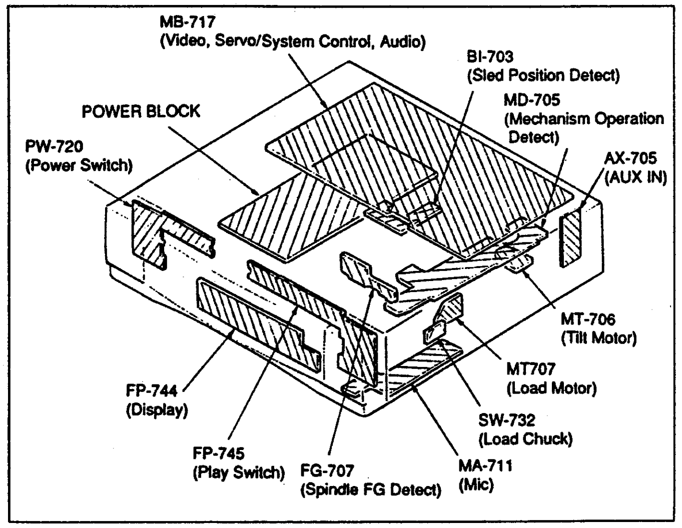
9
10
16
3.15A 125V
F101
C101
C102
CN101
J1
L101
PRIMARY
T101
NC
NC
S4
S3
S2A
S2B
S5
S1
NC
NC
P2
PT
P1
NC
V1
V2
PC101
PC102
IC101
68-4395D
IC201
IC202
IC203
IC204
ICP-N3B
ICP-N3B
PS051
PS052
CN051
REG-12V
GND
REG +12V
AUDIO A GND
UNREG -16V
GND
UNREG +16V
SPDL CTL
SP ERROR
2FH
SP-OFF
REG -5V(SW)
SERVO GND
VIDEO GND
REG +5V(SW)
CN052
P-OFF
EVER +5V
P.CONT
REG +5V(SW)
±12V MONITOR
REG -5V(SW)
DGND
UNREG -16V
CN053
IC051
IC052
1-468-020
12

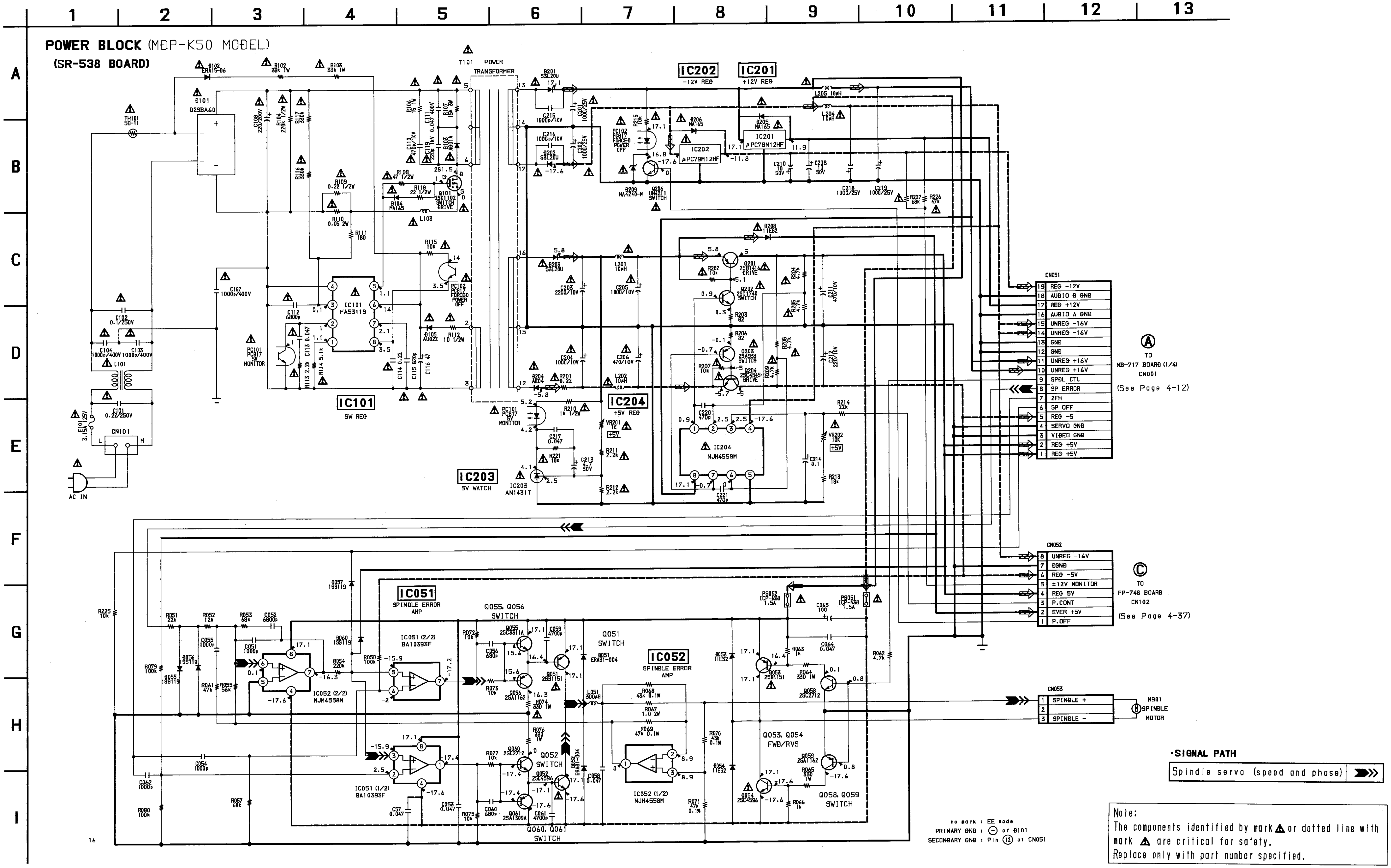

MB-717
(Video, Servo/System Control, Audio)
BI-703
(Sled Position Detect)
MD-705
(Mechanism Operation Detect)
POWER BLOCK
PW-720
(Power Switch)
AX-705
(AUX IN)
MT-706
(Tilt Motor)
MT707
(Load Motor)
SW-732
(Load Chuck)
FP-744
(Display)
FP-745
(Play Switch)
FG-707
(Spindle FG Detect)
MA-711
(Mic)

POWER BLOCK

CN051	C–10	D105	D–4	Q052	E–7
CN052	E–10	D201	B–5	Q053	E–9
CN053	E–9	D202	C–5	Q054	E–9
CN101	B–1	D203	C–6	Q055	D–7
		D204	C–5	Q056	E–7
D051	D–7	D205	A–8	Q058	E–10
D052	D–7	D206	B–7	Q059	E–9
D053	E–9	D208	C–9	Q060	E–7
D054	E–9	D209	E–5	Q061	E–7
D055	D–9	IC051	D–8	Q101	B–3
D056	D–9	IC052	E–8	Q201	B–7
D057	D–9	IC101	D–5	Q202	C–7
D060	C–8	IC201	A–8	Q203	C–7
D101	D–2	IC202	B–7	Q204	C–6
D102	C–2	IC203	E–5	Q206	D–5
D103	C–4	IC204	C–7	VR201	E–6
D104	D–5	Q051	D–7	VR202	E–6

POWER BLOCK SCHEMATIC DIAGRAMS (MDP-K50 MODEL)

— Ref. No. : POWER BLOCK; 5,000 Series —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I
POWER BLOCK (MDP-K50 MODEL)
(SR-538 BOARD)
T101 POWER TRANSFORMER
IC202 -12V REG
IC201 +12V REG
IC202 μPC79M12HF
IC201 μPC78M12HF
IC101 SW REG
IC101 FA5311S
IC203 5V WATCH
IC203 AN1431T
IC204 +5V REG
IC204 NJM4558M
IC051 SPINDLE ERROR AMP
IC051 (2/2) BA10393F
IC051 (1/2) BA10393F
IC052 (2/2) NJM4558M
IC052 SPINDLE ERROR AMP
IC052 (1/2) NJM4558M
Q055, Q056 SWITCH
Q051 SWITCH
Q052 SWITCH
Q053, Q054 FWD/RVS
Q058, Q059 SWITCH
Q060, Q061 SWITCH
Q101 2SK1102 SWITCH DRIVE
Q201 2SB1614 DRIVE
Q202 2SC1740 SWITCH
Q203 2SA933 SWITCH
Q204 2SC4545 DRIVE
Q206 UN4211 SWITCH
PC101 PC817 5V MONITOR
PC102 PC817 FORCED POWER OFF
D101 D2SBA60
TH101 5D-11
F101 3.15A 125V
CN101
L101
AC IN
CN051
19 REG -12V
18 AUDIO D GND
17 REG +12V
16 AUDIO A GND
15 UNREG -16V
14 UNREG -16V
13 GND
12 GND
11 UNREG +16V
10 UNREG +16V
9 SPDL CTL
8 SP ERROR
7 2FH
6 SP OFF
5 REG -5
4 SERVO GND
3 VIDEO GND
2 REG +5V
1 REG +5V
Ⓐ TO MB-717 BOARD (1/4) CN001
(See Page 4-12)
CN052
8 UNREG -16V
7 DGND
6 REG -5V
5 ±12V MONITOR
4 REG 5V
3 P.CONT
2 EVER +5V
1 P.OFF
Ⓒ TO FP-748 BOARD CN102
(See Page 4-37)
CN053
1 SPINDLE +
2
3 SPINDLE -
M901 SPINDLE MOTOR
PS051 ICP-N38 1.5A
PS052 ICP-N38 1.5A
no mark : EE mode
PRIMARY GND : ⊖ of D101
SECONDARY GND : Pin ⑫ of CN051
16

·SIGNAL PATH

Spindle servo (speed and phase)	➤»»

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

POWER BLOCK

ELECTRICAL PARTS LIST

NOTE:

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifie.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: μF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA..., μPA...,
  uPB..., μPB..., uPC..., μPC...,
  uPD..., μPD...

Ref. No.	Part No.	Description	Remarks
	1-413-989-22	POWER BLOCK (A660K:E) ***********	
	1-413-989-42	POWER BLOCK (A660K:Chinese,Hongkong) ***********	
	1-468-020-12	POWER BLOCK (K50) ***********	
			(Ref.No.5,000 Series)
⚠	1-533-223-11	HOLDER, FUSE	
		< CAPACITOR >	
C051	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V	
C052	1-163-019-00	MULTILAYER CERAMIC 6800PF 10% 50V	
C053	1-163-035-00	MULTILAYER CERAMIC 0.047uF 50V	
C054	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V	
C055	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V	
C056	1-163-007-11	MULTILAYER CERAMIC 680PF 10% 50V	
C057	1-163-035-00	MULTILAYER CERAMIC 0.047uF 50V	
C058	1-163-035-00	MULTILAYER CERAMIC 0.047uF 50V	
C059	1-163-017-00	MULTILAYER CERAMIC 4700PF 10% 50V	
C060	1-163-007-11	MULTILAYER CERAMIC 680PF 50V	
C061	1-163-017-00	MULTILAYER CERAMIC 4700PF 10% 50V	
C062	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V	
C063	1-124-122-11	ALUMINUM ELECTRIC 100uF 20% 50V	
C064	1-130-491-00	FILM 0.047uF 5% 50V	
⚠C101	9-902-038-01	METALLIZED 0.22uF 250V	
⚠C102	9-900-521-01	METALLIZED 0.1uF 250V	
⚠C103	1-161-742-00	CERAMIC 2200PF 20% 400V	(A660K)
⚠C103	1-161-741-00	CERAMIC 1000PF 10% 400V	(K50)
⚠C104	1-161-742-00	CERAMIC 2200PF 20% 400V	(A660K)
⚠C104	1-161-741-00	CERAMIC 1000PF 10% 400V	(K50)
⚠C105	1-161-742-00	CERAMIC 2200PF 20% 400V	(A660K)
⚠C106	1-161-742-00	CERAMIC 2200PF 20% 400V	(A660K)
⚠C107	1-161-742-00	CERAMIC 2200PF 20% 400V	(A660K)
⚠C107	1-161-741-00	CERAMIC 1000PF 10% 400V	(K50)
⚠C108	9-933-773-01	ALUMINUM ELECTIC 100uF 400V	(A660K)
⚠C108	9-900-523-01	ALUMINUM ELECTIC 220uF 200V	(K50)

Ref. No.	Part No.	Description	Remarks
⚠C109	9-933-773-01	ALUMINUM ELECTIC 100uF	400V (A660K:E)
⚠C110	9-909-673-01	CERAMIC 220PF 1kV	(A660K)
⚠C110	9-933-752-01	CERAMIC 470PF 1kV	(K50)
⚠C111	9-900-525-01	METALLIZED 0.047uF	400V
⚠C112	1-106-363-00	FILM 0.0068uF 5% 50V	
⚠C113	1-130-483-00	METAILLIZED 0.01uF 5% 50V	(A660K)
⚠C113	1-130-491-00	METAILLIZED 0.047uF 5% 50V	(K50)
⚠C114	1-137-378-11	METALLIZED 0.22uF 5% 50V	
⚠C115	1-130-470-00	FILM 820PF 5% 50V	
⚠C116	1-216-967-11	ALUMINUM ELECTRIC 47uF 20% 50V	
⚠C117	1-161-742-00	CERAMIC 2200PF 20% 400V	(A660K)
⚠C118	1-161-742-00	CERAMIC 2200PF 20% 400V	(A660K)
⚠C119	9-909-673-01	CERAMIC 220PF 1kV	(K50)
⚠C201	1-124-525-11	ALUMINUM ELECTRIC 1000uF 20% 25V	
⚠C202	1-124-525-11	ALUMINUM ELECTRIC 1000uF 20% 25V	
⚠C203	1-124-760-11	ALUMINUM ELECTRIC 2200uF 20% 10V	
⚠C204	1-126-926-11	ALUMINUM ELECTRIC 1000uF 20% 10V	
⚠C205	1-126-926-11	ALUMINUM ELECTRIC 1000uF 20% 10V	
⚠C206	1-126-925-11	ALUMINUM ELECTRIC 470uF 20% 10V	
C208	1-126-964-51	ALUMINUM ELECTRIC 10uF 20% 50V	
C210	1-126-964-51	ALUMINUM ELECTRIC 10uF 20% 50V	
C211	1-126-925-11	ALUMINUM ELECTRIC 470uF 20% 10V	
C212	1-126-923-11	ALUMINUM ELECTRIC 220uF 20% 10V	
C213	1-126-963-11	ALUMINUM ELECTRIC 4.7uF 20% 50V	
C214	1-124-463-11	ALUMINUM ELECTRIC 0.1uF 50V	
C215	9-909-680-01	CERAMIC 1000PF 1kV	
C216	9-909-680-01	CERAMIC 1000PF 1kV	
C217	1-130-491-00	FILM 0.047uF 5% 50V	
C218	1-126-942-61	ALUMINUM ELECTRIC 1000uF 20% 25V	
C219	1-126-942-61	ALUMINUM ELECTRIC 1000uF 20% 25V	
C220	1-130-467-00	FILM 470PF 5% 50V	
C221	1-130-467-00	FILM 470PF 5% 50V	

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
		< CONNECTOR >	
CN051	1-695-342-31	CONNECTOR 19P	
CN052	1-506-473-11	CONNECTOR 8P	
CN053	1-564-506-11	CONNECTOR 3P	
CN101	1-564-419-11	CONNECTOR 2P	
		< DIODE >	
D051	9-902-064-01	DIODE ERA81-004	
D052	9-902-064-01	DIODE ERA81-004	
D053	8-719-200-82	DIODE 11ES2	
D054	8-719-200-82	DIODE 11ES2	
D055	8-719-911-19	DIODE 1SS119	
D056	8-719-911-19	DIODE 1SS119	
D057	8-719-911-19	DIODE 1SS119	
D060	8-719-911-19	DIODE 1SS119	
⚠D101	8-719-510-19	BRIDGE DIODE D2SBA60	
⚠D102	9-902-050-01	DIODE ERA15-06	
⚠D103	8-719-030-25	DIODE EG01C (A660K)	
⚠D103	9-900-512-01	DIODE AG01A (K50)	
⚠D104	9-900-514-01	DIODE MA165	
⚠D105	9-900-535-01	DIODE AU02Z	
⚠D201	8-719-510-72	DIODE S3L20U	
⚠D202	8-719-510-72	DIODE S3L20U	
⚠D203	8-719-510-72	DIODE S3L20U	
⚠D204	8-719-043-74	DIODE AK04	
⚠D205	9-900-514-01	DIODE MA165 (A660K:E,K50)	
⚠D206	9-900-514-01	DIODE MA165 (A660K:E,K50)	
⚠D208	8-719-200-82	DIODE 11ES2	
⚠D209	8-719-035-04	ZENNER DIODE MA4240	
		< FUSE >	
⚠F101	1-532-286-00	FUSE TIME LUG (3.15A 250V) (A660K)	
⚠F101	1-532-745-11	FUSE TIME LUG (3.15A 125V) (K50)	
		< IC >	
IC051	8-759-982-73	IC BA10393F	
IC052	8-759-100-96	IC UPC4558G2	
⚠IC101	8-759-062-58	IC FA5311S	
⚠IC201	8-759-701-79	IC NJM78M12FA	
⚠IC202	8-759-929-65	IC LM7912CT	
⚠IC203	9-900-532-01	IC AN1431T	
⚠IC204	8-759-100-96	IC UPC4558G2	
		< COIL >	
L051	1-424-219-11	CHORKE COIL 300uH	
⚠L101	9-909-675-01	LINE FILTER	

Ref. No.	Part No.	Description	Remarks
⚠L102	9-909-675-01	LINE FILTER	(A660K)
⚠L103	9-904-796-01	BEAD CORE	
⚠L201	9-909-681-01	CHORKE COIL 10uH	
⚠L202	9-909-681-01	CHORKE COIL 10uH	
⚠L204	9-909-681-01	CHORKE COIL 10uH	
⚠L205	9-909-681-01	CHORKE COIL 10uH	
		< PHOTO COUPLER >	
⚠PC101	9-909-676-01	PHOTO COUPLER (A660K)	
⚠PC101	9-900-519-01	PHOTO COUPLER (K50)	
⚠PC102	9-909-676-01	PHOTO COUPLER (A660K)	
⚠PC102	9-900-519-01	PHOTO COUPLER (K50)	
		< IC LINK >	
⚠PS051	1-532-675-21	IC LINK (ICP-N38 1.5A)	
⚠PS052	1-532-675-21	IC LINK (ICP-N38 1.5A)	
		< TRANSISTOR >	
⚠Q051	8-729-117-11	TRANSISTOR 2SB1151-L	
⚠Q052	8-729-019-31	TRANSISTOR 2SC4596E (A660K)	
⚠Q052	8-729-019-32	TRANSISTOR 2SC4596F (K50)	
⚠Q053	8-729-117-11	TRANSISTOR 2SB1151-L	
⚠Q054	8-729-019-31	TRANSISTOR 2SC4596E (A660K)	
⚠Q054	8-729-019-32	TRANSISTOR 2SC4596F (K50)	
Q055	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q056	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q058	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q059	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q060	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q061	8-729-119-76	TRANSISTOR 2SA1175-HFE	
⚠Q101	9-909-669-01	TRANSISTOR 2SK1547 (A660K)	
⚠Q101	9-933-750-01	TRANSISTOR 2SK1102 (K50)	
⚠Q201	8-729-021-99	TRANSISTOR 2SB1416-R	
⚠Q202	8-729-119-78	TRANSISTOR 2SC2785-HFE	
⚠Q203	8-729-119-76	TRANSISTOR 2SA1175-HFE	
⚠Q204	9-909-678-01	TRANSISTOR 2SC4545-R	
⚠Q206	8-729-900-80	TRANSISTOR DTC114ES	
		< RESISTOR >	
R050	1-216-097-00	THICK FILM 100K 1/10W	
R051	1-216-081-00	THICK FILM 22K 1/10W	
R052	1-216-075-00	THICK FILM 12K 1/10W	
R053	1-216-093-11	THICK FILM 68K 1/10W	
R054	1-216-105-00	THICK FILM 220K 1/10W	
R055	1-216-091-00	THICK FILM 56K 1/10W	
R057	1-216-093-11	THICK FILM 68K 1/10W	
R061	1-216-089-00	THICK FILM 47K 1/10W	
R062	1-216-065-00	THICK FILM 4.7K 1/10W	

Note:	Note:
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
R063	1-216-049-11	THICK FILM 1K 1/10W	
R064	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
R065	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
R066	1-216-049-11	THICK FILM 1K 1/10W	
⚠R067	1-216-369-00	CARBON 1 2W	
R068	1-219-387-11	THICK FILM 43K 0.1% 1/10W	
R069	1-219-391-11	THICK FILM 47K 0.1% 1/10W	
R070	1-219-387-11	THICK FILM 43K 0.1% 1/10W	
R071	1-219-391-11	THICK FILM 47K 0.1% 1/10W	
R072	1-216-073-00	THICK FILM 10K 1/10W	
R073	1-216-073-00	THICK FILM 10K 1/10W	
⚠R074	1-215-866-11	CARBON 330 5% 1W	
R075	1-216-073-00	THICK FILM 10K 1/10W	
R076	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
R077	1-216-073-00	THICK FILM 10K 1/10W	
R079	1-216-097-00	THICK FILM 100K 1/10W	
R080	1-216-097-00	THICK FILM 100K 1/10W	
⚠R101	9-900-394-01	NON-FLAMABLE CARBON 1M 1/2W	(A660K)
⚠R102	1-218-642-11	METAL OXIDE FILM 100K 1W	(A660K)
⚠R102	1-215-878-00	METAL OXIDE FILM 33K 1W	(K50)
⚠R103	1-218-642-11	METAL OXIDE FILM 100K 1W	(A660K)
⚠R103	1-215-878-00	METAL OXIDE FILM 33K 1W	(K50)
⚠R104	1-214-921-00	CARBON 220K 1/2W	(A660K:E,K50)
⚠R104	1-260-135-11	CARBON 1M 5% 1/2W	(A660K:Chinese,Hongkong)
⚠R105	1-214-921-11	CARBON 220K 1/2W	(A660K:E)
⚠R106	1-215-860-11	METAL OXIDE FILM 33 1W	(A660K)
⚠R106	1-215-858-00	METAL OXIDE FILM 15 1W	(K50)
⚠R107	1-215-927-00	METAL OXIDE FILM 47K 3W	(A660K)
⚠R107	1-215-924-00	METAL OXIDE FILM 15K 3W	(K50)
⚠R108	1-212-974-00	NON-FLAMABLE CARBON 47 1/2W	
⚠R109	9-909-670-01	METAL FILM 0.22 1/2W	
⚠R110	9-909-671-01	CEMENT 0.1 2W	(A660K)
⚠R110	9-933-751-01	CEMENT 0.05 2W	(K50)
⚠R111	1-249-408-11	CARBON 180 1/4W	
⚠R112	1-212-958-00	NON-FLAMABLE CARBON 10 1/2W	
⚠R113	1-247-839-31	CARBON 2.2K 5% 1/4W	(K50)
⚠R114	1-247-848-11	CARBON 5.1K 1/4W	
⚠R115	1-247-855-31	CARBON 10K 1/4W	
⚠R116	1-247-891-00	CARBON 330K 1/4W	
⚠R117	1-247-891-00	CARBON 330K 1/4W	
⚠R118	1-212-966-00	NON-FLAMABLE CARBON 22 1/2W	
⚠R201	9-909-679-01	FUSE 0.22 1/4W	
⚠R202	1-247-855-31	CARBON 10K 1/4W	
R203	1-249-404-00	CARBON 82 1/4W	
⚠R204	1-247-847-11	CARBON 4.7K 1/4W	
⚠R205	1-247-847-11	CARBON 4.7K 1/4W	
R206	1-249-404-00	CARBON 82 1/4W	
⚠R207	1-247-855-31	CARBON 10K 1/4W	
⚠R208	1-247-847-11	CARBON 4.7K 1/4W	
⚠R209	1-247-847-11	CARBON 4.7K 1/4W	
⚠R210	1-260-099-11	CARBON 1K 1/2W	
⚠R211	1-247-839-31	CARBON 2.2K 5% 1/4W	
⚠R212	1-247-839-31	CARBON 2.2K 5% 1/4W	
R213	1-249-432-11	CARBON 18K 1/4W	
R214	1-249-433-11	CARBON 22K 1/4W	
⚠R215	1-247-855-31	CARBON 10K 1/4W	
⚠R221	1-247-855-31	CARBON 10K 1/4W	
R225	1-247-855-31	CARBON 10K 1/4W	
⚠R226	1-247-871-11	CARBON 47K 1/4W	
⚠R227	1-249-439-11	CARBON 68K 1/4W	
		< SWITCH >	
⚠SW101	1-572-675-11	POWER SWITCH	(A660K:E)
		< TRANSFORMER >	
⚠T101	9-909-674-01	SWITCHING TRANSFORMER	(A660K)
⚠T101	9-933-753-01	SWITCHING TRANSFORMER	(K50)
		< THERMISTOR >	
⚠TH101	9-904-783-01	POWER THERMISTOR	(A660K:E,K50)
		< VARIABLE RESISTOR >	
⚠VR201	1-223-236-11	CARBON TRIMMER POTENTIOMETER 1K	
⚠VR202	1-223-239-11	CARBON TRIMMER POTENTIOMETER 10K	

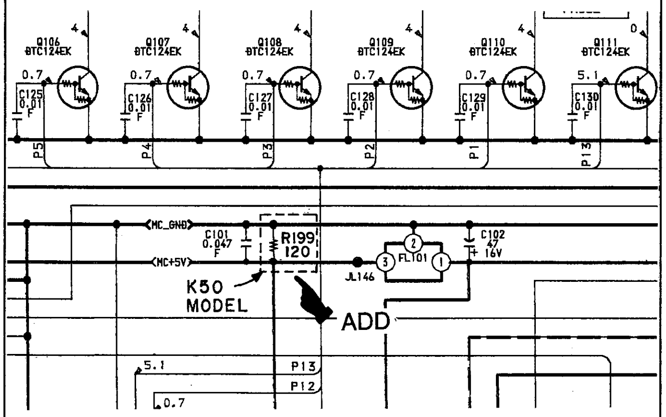
Note:	**Note:**
The components identified by matk ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifie.

☛ : Indicates Changed portion.

(Page 4-37.)

FP-744 BOARD

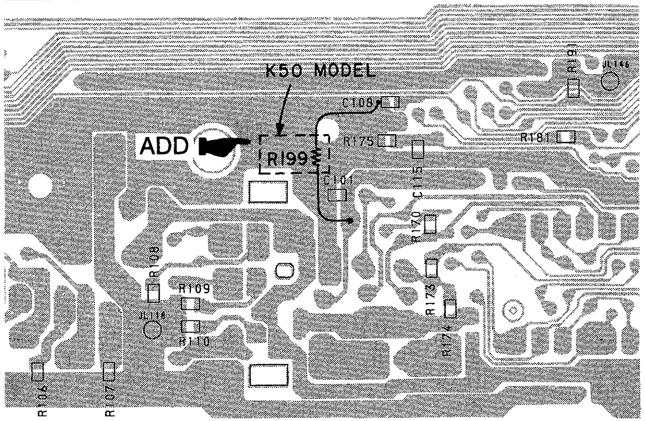
Location : D-22


Q106 DTC124EK
Q107 DTC124EK
Q108 DTC124EK
Q109 DTC124EK
Q110 DTC124EK
Q111 DTC124EK
4
0
0.7
5.1
C125 0.01 F
C126 0.01 F
C127 0.01 F
C128 0.01 F
C129 0.01 F
C130 0.01 F
P5
P4
P3
P2
P1
P13
MC_GND
MC+5V
C101 0.047 F
R199 120
C102 47 16V
FL101
JL146
K50 MODEL
ADD
P13
P12
0.7

(Page 4-33.)

FP-744 BOARD (CONDUCTOR SIDE)

Location : G-11


K50 MODEL
ADD
R199
C108
R175
R181
R191
C101
C115
R170
R108
R109
R110
R173
R174
R106
R107

(Page 5-8.)

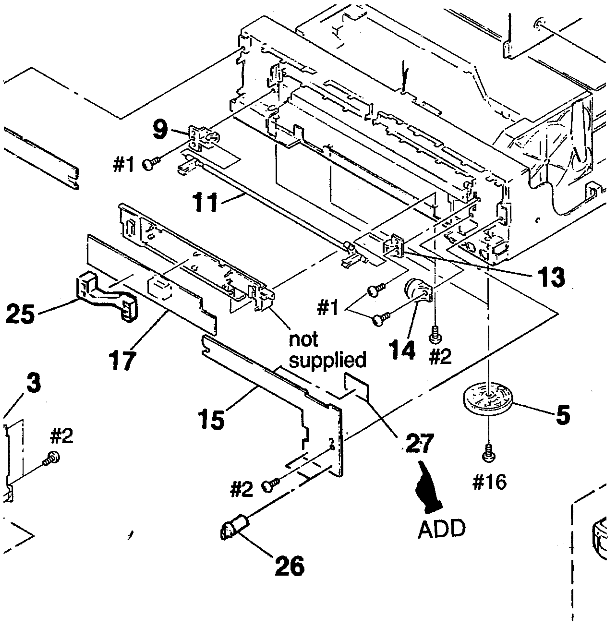
FP-744 BOARD, COMPLETE

	R163	1-216-035-00	METAL CHIP	270	5%	1/10W
	R165	1-216-035-00	METAL CHIP	270	5%	1/10W
Delet	R167	1-216-035-00	METAL CHIP	270	5%	1/10W
☛	R168	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
	R169	1-216-035-00	METAL CHIP	270	5%	1/10W
	R170	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
	R171	1-216-049-91	METAL GLAZE	1K	5%	1/10W
	R172	1-216-089-00	METAL CHIP	47K	5%	1/10W
	R173	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
	R174	1-216-089-00	METAL CHIP	47K	5%	1/10W
	R175	1-216-073-00	METAL CHIP	10K	5%	1/10W
	R176	1-216-295-91	CONDCTOR, CHIP	(2012)		
	R177	1-216-295-91	CONDCTOR, CHIP	(2012)		
	R178	1-216-295-91	CONDCTOR, CHIP	(2012)		
	R179	1-216-295-91	CONDCTOR, CHIP	(2012)		
	R180	1-216-295-91	CONDCTOR, CHIP	(2012)		
	R181	1-216-073-00	METAL CHIP	10K	5%	1/10W
	R187	1-216-295-91	CONDCTOR, CHIP	(2012)		
	R188	1-216-073-00	METAL CHIP	10K	5%	1/10W
	R190	1-216-073-00	METAL CHIP	10K	5%	1/10W
ADD	R191	1-216-295-91	CONDCTOR, CHIP	(2012)		
☛	R199	1-249-406-11	CARBON	120	5%	1/4W

< SWITCH >

(Page 5-1.)

5-1-1.CASE AND FROT PANEL ASSEMBLY


9
#1
11
13
25
#1
not supplied
14
#2
17
3
5
15
#2
27
#16
#2
ADD
26

Ref. No.	Part No.	Description	Remarks
* 27	3-347-783-21	SHEET (SW)	

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